

**A generic revision of the insect order Phasmatodea: The New World genera of the stick insect subfamily Diapheromerinae: Diapheromerinae = Heteronemiidae: Heteronemiinae sensu Bradley & Galil, 1977\***

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**A generic revision of the insect order Phasmatodea: The New World genera of the stick insect subfamily Diapheromerinae (Diapheromeridae) = Heteronemiinae (Heteronemiidae) sensu Bradley & Galil, 1977\***

- The North and South American genera of the phasmatodean subfamily Diapheromerinae = Heteronemiinae sensu Bradley & Galil are revised. All genera are redescribed, type species are mentioned or designated, and synonyms listed. Two new tribes, Ocnophilini and Oreophoetini, are established, and the Libethrini are synonymized with Diapheromerini. Genitalia, eggs and important other characters of most genera are figured. Ten new genera are introduced and five new species are described. Previously unknown males, females and eggs of several species are described. The genera are arranged in groups, with separate keys to all tribes and generic-level groups, including males, females, and eggs to the extent currently known.

**Key-words:** Orthoptera - Phasmatodea - Diapheromerinae - Heteronemiinae - suprageneric revision - Diapheromerini - Ocnophilini - Oreophoetini - new genera - new species - new synonyms - lectotypes - North America - South America.

## INTRODUCTION

Although a good number of the world's largest and most spectacular insects belong to the Phasmatodea, this order remains comparatively poorly known. It is still a problem to attribute males or females to a species described on just one sex as both sexes normally look quite different.

During the last few decades, phasmids have become more interesting to amateur entomologists and rearers. As a result, definite pairs of approximately 300 species are known from cultures; several of these are still undescribed.

\* Dedicated to my parents Gisela and Rolf Zompro.

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The most striking problem is lack of identification keys even at the generic level. The only monograph concerning this insect order, by Karl Brunner v. Wattenwyl (1907) and Josef Redtenbacher (1906, 1908), published in three parts, contains numerous errors, yet it still remains about the major reference point for specialists. A later basic paper on stick insect systematics was published by Günther (1953), which included keys to subfamilies. More recently, most specialists have been using the work by Bradley & Galil (1977) which, although mainly based on literature studies, included keys to tribes.

The present work is based on the author's unpublished thesis (1998d) and represents an updated version.

## MATERIAL AND METHODS

Whenever possible, this work has been based on type material. In many cases, the matching of the sexes has been confirmed by rearing species. However, in a few cases non-type material has been used. This study has received support from almost all curators of stick insect collections in European museums. Material from several private collections has also been examined.

Stick insects were reared in cages and preserved as described by Zompro (1996). Examinations were carried out using a Zeiss Jena Citoval-2 stereoscope and drawings made using a drawing tube. Pictures of genitalia were made at 10x magnification, eggs at 20x. The terminology of egg structures follows that of Clark Sellick (1997).

Antennae are measured against the body, and not against the forelegs as usual. This has the advantage that the length can be compared in specimens with reproduced or broken legs, too.

## Abbreviations used

AMNH	American Museum of Natural History, New York, USA.
ANSP	Academy of Natural Sciences, Philadelphia, USA.
BMNH	The Natural History Museum, London, England.
DEIC	Deutsches Entomologisches Institut, Eberswalde, Germany.
ETHZ	Eidgenössische Technische Hochschule, Zurich, Switzerland.
HLDH	Hessisches Landesmuseum, Darmstadt, Germany.
HMUG	Hunterian Museum, University of Glasgow, England.
MCSN	Museo Civico di Storia Naturale „Giacomo Doria“, Genova, Italy.
MHNG	Muséum d'histoire naturelle, Geneva, Switzerland.
MIZT	Museo Regionale Scienze Naturali, Torino, Italy.
MNHN	Muséum National d'Histoire Naturelle, Paris, France.
NHMW	Naturhistorisches Museum, Vienna, Austria.
NHME	Natural History Museum, Maastricht, Netherlands.
NHRS	Naturhistoriska Riksmuseet, Stockholm, Sweden.
OXUM	Hope Entomological Collections, University Museum, Oxford, England.
OZ	Coll. O. Zompro, Kiel, Germany, affiliated with Zoologisches Museum, Kiel.
RMNH	Nationaal Natuurhistorische Museum, Leiden, Netherlands.



SMFD	Forschungsinstitut und Naturmuseum Senckenberg, Frankfurt, Germany.
SMNS	Staatliches Museum für Naturkunde, Stuttgart, Germany.
SMTD	Staatliches Museum für Tierkunde, Dresden, Germany.
USNM	United States National Museum, Washington, USA.
ZMUH	Zoologisches Museum der Universität Hamburg, Germany.
ZMHB	Zoologisches Museum der Humboldt-Universität, Berlin, Germany.
ZMUC	Zoologisk Museum, University of Copenhagen, Denmark.

HT, AT, PT, ST, LT, PLT: Holo-, allo-, para-, syn-, lecto-, paralectotype.

\* = Material examined, in some cases by colour prints only.

#### BASIC TAXONOMIC BACKGROUND

As noted above, Bradley & Galil (1977) mainly based their work on literature sources, hence several of the inaccurate statements by previous authors are inadvertently repeated and some others added. The Heteronemiinae are discussed on pages 178-180. In discussing the family Heteronemiidae (p. 179), Bradley & Galil adopt Rehn's (1904: 53) opinion that *Bacunculus* Burmeister is a synonym of *Heteronemia* Gray. Zompro (in press) showed, that *Heteronemia* Rehn (nec Gray) is a synonym of *Pseudosermyle* Caudell. Further errors (all on p. 180) are as follows: the type-species of *Bacunculus* Burmeister is *Bacunculus spatulatus* Burmeister, 1838, a synonym of *Heteronemia mexicana* Gray, 1835, synonymized by Zompro (in press), but not Bradley & Galil, as their point of view on the identity of *H. mexicana* was based on Rehn's misidentification. The type of *Heteronemia* Gray is correctly mentioned later on p. 201. The authors of *Manomera* are Rehn & Hebard, 1907, not Rehn alone; *Ocnophylla* should be corrected as *Ocnophila* Brunner v. W., 1907; *Trichopeplus* should read *Trychopeplus* Shelford, 1909.

The key to the tribes of Bradley & Galil's Heteronemiinae, including their Heteronemiini and the Libethrini, as given by Bradley & Galil (1977) is solely based on structural differences in ♂ genitalia, this meaning that no single ♀ could be properly assigned even to a tribe. Their Heteronemiini is characterized by "Margins of 9th tergum of ♂ turned downward and overlapping ventrally so that the segment, at least apically, appears as closed tube", the Libethrini by "Margins of 9th tergum of ♂ built normally, not ending in closed tube". Indeed, the genus *Libethra* Stål keys out into their Heteronemiinae, while the genera *Diapheromera*, *Manomera* and *Pseudosermyle* key into the Libethrini. Therefore it is proposed Libethrini sensu Bradley & Galil is a synonym of their Heteronemiini. The genera *Clonistria* Stål and *Bostra* Stål, both members of the Phasmatidae: Cladomorphinae: Hesperophasmatini in the sense of Bradley & Galil (1977), key out to their Heteronemiini, and are here transferred.

The correct name for the Heteronemiidae sensu Bradley & Galil is *Diapheromeridae*, introduced by Kirby, 1904, as shown by Zompro (in press), as, after examination of the type-specimen of the type-species of *Heteronemia* Gray, *Heteronemia mexicana* Gray, 1835, this genus belongs into the suborder Areolatae, while all other genera and species included (more than 50% of all described phasmids) belong to the Anareolatae.

The family Diapheromeridae (=Heteronemiidae sensu Bradley & Galil) contains mainly stick-like phasmids divided into five subfamilies. Palophinae and are distributed in the Afro-Tropical region, Pachymorphinae in the Afro-Tropical, Oriental and Australian regions, and Necrosciinae and Lonchodinae in the Oriental und Australian regions. The Diapheromerinae are restricted to the New World; one genus in the Afro-Tropical and one in the Asian region are doubtful and are possibly members of Palophinae.

## RESULTS AND COMMENTS

### DIAPHEROMERINAE

In this section, the tribes, generic groups and genera of the Diapheromerinae are described and discussed. Every part starts with a list of the genera included, followed by characteristics of the group and a key to the constituent subgroups. Then each genus involved is assessed and discussed. The lists of "species included" are not intended to be complete, as they only include the species which have been examined by the author and / or are considered to be definite members of the respective genus. This should serve as support to further revisors. All species are listed with the genus and specific name of the original description.

In the keys, the median segment (first abdominal segment, fused with meta-thorax, but to recognize by a more or less developed dividing line) is often used as a character. This has the advantage that in many cases specimens can be determined to generic level even when the appendices are broken.

The Diapheromerinae are to be split into three tribes. These contain the following genera, synonyms included (in alphabetical order):

Diapheromerini: *Alienobostra* gen. n.; *Bacteria* Latreille, Le Pelletier, Audinet-Serville & Guérin, 1828 (= *Pseudobacteria* Saussure, 1870); *Bostra* Stål, 1875; *Calynda* Stål, 1875; *Caribbiopheromera* gen. n.; *Clonistria* Stål, 1875; *Diapheromera* Gray, 1835; *Dyme* Stål, 1875; *Globocalynda* gen. n.; *Libethra* Stål, 1875; *Libethroidea* Hebard, 1919; *Litosermyle* Hebard, 1919; *Manomera* Rehn & Hebard, 1907; *Megaphasma* Caudell, 1903; *Rugosolibethra* n. n. (= *Caulonia* Stål, 1875 (nec Lorient)); *Oncotophasma* Rehn, 1904 (= *Paradiapheromera* Brunner v. W., 1907); *Paracalynda* gen. n.; *Paraclonistria* Lelong & Langlois, 1998; *Paraphanocles* gen. n.; *Phanocles* Stål, 1875; *Phanocloidea* gen. n.; *Phantasca* Redtenbacher, 1908; *Pseudoceroys* Hebard, 1923; *Pseudosermyle* Caudell, 1903; *Pterolibethra* Günther, 1940; *Rhabdoceratites* Rehn & Hebard, 1912 (= *Ceratites* Rehn & Hebard, 1909; = *Ceratita* Strand, 1926); *Sermyle* Stål, 1875 (= *Hoplolibethra* Caudell, 1904); *Spinopeplus* gen. n.; *Trychopeplus* Shelford, 1909.

Ocnophilini: *Dubiophasma* gen. n.; *Exocnophila* gen. n.; *Ocnophila* Brunner v. W., 1907; *Ocnophiloidea* gen. n.; *Parocnophila* Zompro, 1998.

Oreophoetini: *Oreophoetes* Rehn, 1904 (= *Allophyllus* Brunner v. W., 1907).

Incertae sedis: *Bactricia* Kirby, 1896 (= *Scaphegyna* Karsch, 1898); *Pseudobactricia* Brock, 1999.

**Key to the adults and nymphs of tribes of Diapheromerinae:**

- 1 Profemora straight. . . . . Oreophoetini
- Profemora curved basally. . . . . 2
- 2 Meso- and metafemora trapezoid in cross section, often armed  
(projecting keels or carinae not to be considered). . . . . Diapheromerini
- Meso- and metafemora rectangular in cross section, obviously higher  
than wide, not armed (projecting keels or carinae are to be disregarded). .  
. . . . . Ocnophilini

**Key to the eggs of tribes of Diapheromerinae**

- 1 Capsule laterally almost round, in cross section rhombic. . . . . Oreophoetini
- Capsule different. . . . . 2
- 2 Capitulum absent. . . . . 3
- Capitulum present. . . . . Diapheromerini
- 3 Micropylar plate with broad, whitish margin, capitulum absent. . . . Ocnophilini
- Micropylar plate different. . . . . Diapheromerini

**TRIBE DIAPHEROMERINI**

Characteristics. Stick-insect habitus; tibiae without area apicalis; abdomen at least as long as, usually distinctly longer than thorax; profemora not serrated; meso- and metafemora not evenly serrated ventrally, sometimes with few distal teeth, mostly unarmed; antennae distinctly longer than profemora; rarely winged; anal segment of ♂ neither split nor bilobed; eggs with or without capitulum.

Comments on Diapheromerini. The Diapheromerini contains the bulk of Diapheromerinae. Seven groups of genera may be distinguished by adults and egg morphology. The *Phanocles* group contains the largest members, the ♂ sometimes being winged. The egg and ♂ genitalic structures of its genus *Alienobostra* n. g. show similarities with the *Bacteria* group, but in the main characters it is a typical member. In the *Bacteria* group, the genus *Paracalynda* displays the same metamorphoses of the first antennal segments as *Manomera* of the *Diapheromera* group. The *Caribbio-pheromera* group agrees with the latter in structure of the ♂ genitalia. The following three groups differ from the previous ones by the absence of a capitulum in the eggs, but it is impossible to separate the *Sermyle* group, in which the eggs lack a capitulum, from the *Diapheromera* group. The *Sermyle* group includes specialized genera which glue their eggs to a substrate. The genera of the *Clonistria* group show tendencies of developing highly specialized metamorphosis of the body and extremities; the most striking members belonging to *Trychopeplus* with several lichen-like species. Their eggs are bullet-shaped. The *Dyme* group includes highly elongated species, their flattened eggs resembling those of the Ocnophilini.

**Key to the generic groups of Diapheromerini:**

♂ ♂:

- 1 Tergite X closed ventrally by sternite X, appearing as a closed tube, vomer not produced . . . . . 2
- Tergite X not closed by sternite X ventrally, vomer produced. . . . . 4
- 2 Meso- and / or metafemora with one or more spines ventrally. . . . . *Diapheromera* group
- Meso- and metafemora without spines ventrally. . . . . 3
- 3 Median segment considerably shorter than metathorax. . . . . *Sermyle* group
- Median segment almost as long as metathorax. . . . . *Caribbiopheromera* group
- 4 Median segment more than half as long as metathorax. . . . . *Phanocles* group
- Median segment less than half as long as metathorax. . . . . 5
- 5 Thorax and median segment distinctly longer than abdomen. . . . . *Bacteria* group
- Thorax and median segment not distinctly longer than abdomen, often shorter. 6
- 6 Mesonotum in the middle less than 19 times as long as wide. . . . . *Clonistria* group
- Mesonotum in the middle more than 20 times as long as wide. . . . . *Dyme* group

♀ ♀:

- 1 Thorax and abdomen with longitudinal carinae. . . . . *Sermyle* group
- Thorax and abdomen without longitudinal carinae. . . . . 2
- 2 Thorax with median segment at least one quarter longer than abdomen. . . . . 4
- Thorax with median segment less than one quarter longer than abdomen, often shorter. . . . . 3
- 3 Mesonotum in the middle less than 8 times as long as wide. . . . . *Clonistria* group
- Mesonotum in the middle more than 9 times as long as wide. . . . . *Dyme* group
- 4 Metathorax less than 1.5 times as long as median segment. . . . . 5
- Metathorax more than 2.5 times as long as median segment. . . . . *Diapheromera*-, *Bacteria* group
- 5 Abdomen smooth. . . . . *Phanocles*-group
- Abdomen granulated, smaller than 10 cm. . . . . *Caribbiopheromera* group

Eggs:

- 1 Capitulum present. . . . . 2
- Capitulum absent. . . . . 4
- 2 Area between micropylar plate and operculum distinctly concave. . . . . *Phanocles* group
- Area between micropylar plate and operculum round, not concave. . . . . 3
- 3 Capsule length equal with height. . . . . *Caribbiopheromera* group
- Capsule length considerably longer than height. *Diapheromera*-, *Bacteria* group
- 4 Capsule elongated, glued to a surface ventrally. . . . . *Sermyle* group
- Capsule not glued to a surface. . . . . 5
- 5 Capsule laterally subquadrate, with irregular, broad elevations. . . . . *Dyme* group
- Capsule bullet-like . . . . . *Clonistria* group



*Phanocles* group

Genera. *Alienobostra* gen. n.; *Phanocloidea* gen. n.; *Bostra* Stål, 1875; *Paraphanocles* gen. n.; *Phanocles* Stål, 1875.

Characteristics. Large Diapheromerini. Scapus strikingly flat, roundly rectangular. ♂ with vomer; body always shorter than in ♀. Subgenital plate of ♀ often projecting beyond abdomen and spear-like. Basitarsus always carinated, carina flat or produced like a high, triangular crest.

Eggs with capitulum, micropylar plate inserted in an angle less than 90° to the operculum; concave between micropylar plate and operculum.

Comments on the *Phanocles* group. *Phanocloidea*, *Phanocles* and *Paraphanocles* are more closely related to each other than the other genera, as they all have a median segment that is longer than the metathorax. *Bostra* has a shorter median segment, but the ♂ genitalia show relations to *Paraphanocles*. The shortest median segment is found in *Alienobostra*; but it is still much longer than in the following *Bacteria* group. *Alienobostra* seems to be isolated within this group: It is the only genus whose ♂ subgenital plate is not bulbous but strikingly small and flat; the vomer has two appendices instead of one; the cerci are very long and specialized, as is known in the *Diapheromera* group only; the micropylar plate of the egg is only half as long as the capsule.

**Key to the genera of the *Phanocles* group**

♂ ♂:

- 1 Cerci distinctly longer than abdominal segment X. . . . . *Alienobostra*
- Cerci not longer than abdominal segment X. . . . . 2
- 2 Median segment at best as long as metathorax or shorter. . . . . *Bostra*
- Median segment distinctly longer than metathorax. . . . . 3
- 3 Subgenital plate elongated in a hump or tooth posteroventrally. . . . . 4
- Subgenital plate rounded posteroventrally, not elongated. . . . . *Phanocloidea*
- 4 Abdominal segment X as wide as posterior half of IX. . . . . *Phanocles*
- Abdominal segment X widened posteriorly, wider than IX. . . . . *Paraphanocles*

♀ ♀:

- 1 Metathorax as long as or longer than median segment. . . . . 2
- Median segment longer than metathorax. . . . . 3
- 2 Median segment as long as metathorax. . . . . *Bostra*
- Median segment shorter than metathorax. . . . . *Alienobostra*
- 3 Head depressed, distinctly longer than wide. . . . . *Phanocloidea*
- Head globose, only slightly longer than wide, armed. . . . . 4
- 4 Abdominal tergite VI with lateral lobes. . . . . *Phanocles*
- Abdominal tergite VI without lateral lobes. . . . . *Paraphanocles*

Eggs:

- 1 Micropylar plate half as long as capsule. . . . . *Alienobostra*
- Micropylar plate distinctly longer. . . . . 2

- |   |  |                      |
|---|--|----------------------|
| 2 | Capsule flattened laterally, parallel-sided, surrounded by compact hairy structures. . . . . | <i>Bostra</i>        |
| - | Lateral margins of capsule not flattened, more globose. . . . .                              | 3                    |
| 3 | Capsule punctured. . . . .   | 4                    |
| - | Capsule different. . . . .   | <i>Phanocloidea</i>  |
| 4 | Capitulum with uniform, round impressions. . . . .   | <i>Paraphanocles</i> |
| - | Capitulum with irregular impressions. . . . .  | <i>Phanocles</i>     |

***Phanocloidea* gen. n.**

Figs 1-2, 70-71

Type-species. *Bacteria nodulosa* Redtenbacher, 1908: 416, by present designation.

*Bacteria*: Burmeister, 1838: 563 (part.); Westwood, 1859: 20 (part.); Saussure, 1870: 151; Stål, 1875: 6, 14; 1875: 29; 1875: 11; Rehn, 1904: 61; Redtenbacher, 1908: 412; Shelford, 1909: 362; Zompro, 2000: 171.

Material examined and species included. *Bacteria aequatorialis* Redtenbacher, 1908: 419: HT ♀ nymph-5, Cachabí, Ecuador, circa 500ft, XI.96, Rosenberg [NHMW\*]; *Bacteria divergens* Redtenbacher, 1908: 418: ST ♀, Cayenne, Prudhomme, 620/85 [MHNG\*]; *Bacteria freygessneri* Redtenbacher, 1908: 421: HT ♀, Guatemala, Mr. H. d. Saussure, 2/14 [MHNG\*]; *Mantis filiformes* Fabricius, 1787: 227: HT ♀, no data [HMUG\*]; *Bacteria muricata* Burmeister, 1838: 564: ST ♂, Pará, Sieber, ♀, no data [ZMHB\*]; *Bacteria nodulosa* Redtenbacher, 1908: 416: ST ♂, Museum Paris, Guyane Franc., F. Geay 1900 [NHMW\*]; ST ♂, Cayenne, leg. Thorey, 805 [NHMW\*]; ST ♂, no data [SMNS\*]; 4 ♂♂, 4 ♀♀, several eggs: Culture O. Zompro [OZ\*]; *Bacteria redtenbacheri* Brock, 1998c: 34, n. n. for *Bacteria innocens* Redtenbacher, 1908: 420: HT ♂, Callanga (Peru), Staudinger [NHMW\*]; *Bacteria rufopecta* Redtenbacher, 1908: 416: HT ♂, Cayenne, Prudhomme, 620/85 [MHNG\*]; *Bacteria satyr* Redtenbacher, 1908: ST ♀, Brasil [SMTD\*]; *Bacteria schulthessi* Redtenbacher, 1908: 419: HT ♀, Ecuador [ETHZ\*]; *Bacteria segmentaria* Redtenbacher, 1908: 420: HT ♂, Colombia ?, Mus. Dresden [NHMW\*];

Diagnosis. ♂ ♀. A typical member of the *Phanocles* group. *Phanocloidea* differs from *Alienobostra* and *Bostra* in the longer median segment, from *Phanocles* and *Paraphanocles* in structure of the ♂ genitalia and in the ♀ in the flat, non-globose head. The egg is similar to that of *Phanocles* and *Paraphanocles*, but its capsule is not punctured.

Description. Large Diapheromerini. Head distinctly longer than wide, vertex slightly elevated or swollen, armed or unarmed, eyes projecting hemispherically. Scapus flat, roundly rectangular, pedicellus subcylindrical, two-thirds (♂) or half (♀) as long and two-thirds as wide. Antennae exceeding end of abdominal segment IV (♂) or III (♀). Prothorax as long as head but considerably narrower. Mesonotum strongly elongated, slightly narrower (♂) or of same width (♀) as prothorax, smooth in ♂, smooth, granulated, tuberculated or spinose in ♀. Metathorax about one-third as long as mesothorax, equal or different in structure. Profemora curved basally, triangular in cross section, laminate. Meso- and metafemora trapezoid in cross section, sometimes with small ventroapical spines, smooth, serrated or bilobed. Tibiae distinctly longer than femora. Probasitarsus distinctly (♂) or slightly (♀) longer than following segments combined. Mesobasitarsus as long as, metabasitarsus longer than (♂) or as long as (♀) following segments combined. Basitarsi carinate to cristate dorsally. Median

segment much (♂) or slightly (♀) longer than metathorax. Abdominal segment II shorter than median segment. Segment II longer (♂) or slightly shorter than (♀) III; III to V increasingly longer, VI shorter than V, VII shorter than VI, latter widest in ♀. Segment VIII of ♂ dilated posteriorly, IX wider than VIII or X, narrowed posteriorly. Segment X subquadrate, emarginated posteriorly. Segment IX longer than VIII, latter as long as X. Cerci short, directed downwards, not longer than X. Subgenital plate bulgy. Vomer produced. Segments VIII to X of ♀ narrower than previous segments, all of equal width. Segment VIII longer than IX, latter and X of similar length. Segment X quadrate dorsally, posterior margin with an emargination (♂). Cerci shorter than X, slightly surpassing X by less than its half-length. In ♀, praeopercular organ produced, subgenital plate in posterior half with a ventromedian carina slightly to considerably surpassing the tip of abdomen.

Obviously some ♂♂ of this genus possess more or less well-developed tegmina and alae.

Derivatio nominis. *Phanocloidea* mirrors the close relationship to *Phanocles* Stål.

Distribution. Northern South America.

Comments on the genus. This genus includes many of the species published under the name "*Bacteria*". *Phanocloidea* includes both apterous ♂♂ and those with fully developed wings.

The erstwhile genus *Bacteria* auct. is heterogenous without any doubt, with the predictable result that, along with further revisions at the species level, it will be splitted. *Phanocloidea* is but a first step, for its type is known from both sexes and the egg is documented as well. For further comments see *Bacteria*.

Different characteristics vary between the species of *Bacteria* auct., yet the known material does not allow for significant morphological tendencies to be revealed. The head can be oblong depressed or the vertex elevated, with long spines or horns or totally unarmed, the thorax smooth to prominently spinose, the metatarsi dorsally with a small carina or a prominent, triangular crest.

Zompro (2000) presents a SEM study of the egg of *Phanocloidea nodulosa* (Redtenbacher, 1908) and the first description of the female. This work includes figures of the adults.

*Phanocles* Stål, 1875

Figs 3- 5, 72-75

*Phanocles*: Stål, 1875: 28; *Bacteria*: Redtenbacher, 1908: 412 (part.); Shelford, 1909: 363, pl. 7: 3b.

Type-species. *Bacteria burkartii* Saussure, 1868: 65, by subsequent designation of Kirby, 1904: 353.

Material examined and species included. *Phanocles burkartii* (Saussure, 1868: 65): 2 ♀, Mexico, Soconusco (Chiapas) 1200m üB. Meer, Herm.-Hans Kolow, 6.7.1900, 1 egg ex ovipositor [ZMUH\*; OZ \*]; ♀, Mexico, Deyrolle [NHMW\*]; *Bacteria sartoriana* Kaup & Heyden, 1871: 18, 29, pl. 1: 5: HT ♀, Mexico, (Sartorius) v. Heyden. n. syn. of *Phanocles burkartii* (Saussure) [SMFD\*]; *Phanocles* n. sp. Hennemann i. pr. HT ♂, Bred England, Essex, Hockley, 1992. PSG 47, AJE. Harman, PT ♀, Bred England, Essex, Hockley, 1991. AJE. Harman. Originally Costa Rica 1989 [Coll. F. Hennemann\*].

Complementary description. ♂ ♀. Head subglobose, only slightly longer than wide. Eyes projecting hemispherically, two humps or tubercles behind eyes. Scapus flat, rectangular with rounded edges, pedicellus one-third as long and two-thirds as wide, antennae projecting beyond abdominal segment IV (♂) or reaching the anterior half of II (♀). Prothorax as long as head. Mesothorax strongly elongated, narrower than prothorax and smooth (♂) or as wide as prothorax and granulated to spinose (♀). Metathorax structured as mesothorax, a little longer than prothorax. Profemora curved basally, triangular in cross section, edges laminate. Meso- and metafemora trapezoid in cross section, mesofemora in anterior quarter with small lobes ventrolaterally, with a row of (sometimes indistinct) spines ventro-apically (at least in ♀). Tibiae considerably longer than femora. Basitarsi of ♂ with a low carina, of ♀ with a high, triangular carina. Probasitarsus longer than (♂) or as long as, mesobasitarsus as long as (♂) or shorter than, metabasitarsus as long as (♂) or shorter than (♀) following segments combined. Abdominal segment II shorter than median segment, segment III longer than II, in ♂ length very slightly increasing from III to V, segment VI as long as II, VII half as long as V; VIII to X combined as long as V; VIII as long as IX; X two-thirds of IX. Segment VIII equally dilated, IX before middle abruptly narrowed, posterior half as wide as X; latter slightly emarginated posteriorly. Cerci shorter than X, slightly curved, directed downwards. Subgenital plate prominent, posteriorly elongated into an appendix, flattened posteromedially. In ♀, segments III to V increasingly longer, VI as long as IV, with lobes posterolaterally, segment VII as long as II. Praeopercular organ produced. Segments VIII to X combined as long as VI; segments IX and X of equal length, VIII considerably longer. Cerci straight, slightly projecting beyond segment X. Subgenital plate broad, distinctly projecting beyond tip of abdomen.

Egg. Capsule irregularly oval, with punctured structure. Micropylar plate elongated, longer than two-thirds of capsule. Operculum oval. Capitulum smooth, high, with several irregular impressions.

Distribution. Central America.

Comments on the genus. The drawings by Saussure (1870: 151, pl. 3: 6) and Shelford (1909: 363, pl. 7: 3b) show the ♀ without lateral lobes, despite these being mentioned in the original diagnosis; consequently all following authors erroneously synonymized *Phanocles* with *Bacteria*, including some species which now belong to *Phanocloidea* n. g. The lobes are convergent to those in the Oriental genus *Pharnacia* Stål, 1877 and are in fact of generic value. The genus is easiest to separate from *Phanocloidea* by the posteroventrally elongated subgenital plate of the ♂ and the globose head of the ♀; the egg by its punctured structure. Possibly some ♂♂ of this genus are winged (as in *Phanocloidea* or some species of the erstwhile *Bacteria*). The complementary description above has been complemented by the ♂ of a new species from Costa Rica (Hennemann, in press).

***Paraphanocles* gen. n.**

Figs 6-7, 76-77, 124-125

*Bacteria*: Redtenbacher, 1908: 412 (part.).

Type-species. *Mantis keratosqueleton* Olivier, 1792: 639, by present designation.



Material examined and species included. *Mantis keratoskeleton* Olivier, 1792: 639: ♀, Trinidad, Port-of-Spain 1914. H. Woortman leg. vend. 22.8.1921 [ZMUH\*]; ♂, Trinidad, Brit. West. Ind. W. Griem leg. 24.9.38. Eing. 48/38 [ZMUH\*]; 2 ♂♂, 2 ♀♀, several eggs: Ex culture O. Zompro. Origin of culture stock: Martinique [OZ\*]; = *Phasma cornutum* Lichtenstein, 1796: 78, synonymized by Gray, 1835: 16; = *Phasma bicornis* Stoll, 1785: 15: 57: ST ♀, no data [RMNH\*], synonymized by Redtenbacher, 1908: 422; = *Bacteria cyphus* Westwood, 1859: 24, pl. 7: 7, synonymized by Redtenbacher, 1908: 422; = *Phanocles curvipes* Redtenbacher, 1882: 27, pl. 15: 9; synonymized by Redtenbacher, 1908: 422; = *Bacteria bellangeri* Redtenbacher, 1908: HT ♂, Martinique, Mus. Paris, leg. V. Bellanger [NHMW\*], synonymized by Zompro, 1998: 6; = *Bacteria bradypus* Redtenbacher, 1908: ST ♀, Antilles, Mus. Paris [NHMW\*], synonymized by Zompro, 1998: 6; = *Bacteria integra* Redtenbacher, 1908: HT ♀, Trinidad, leg. Boucard [NHMW\*], synonymized by Zompro, 1998: 6; = *Bacteria maxwelli* Redtenbacher, 1908: 421: ST 3 ♂♂, 2 ♀♀, Barbados, Maxwell Lefroy [NHMW\*], synonymized by Zompro, 1998: 6.

Diagnosis. ♂♀. Closely related to *Phanocles*, differing in ♂ morphology of tergite X, which is dilating and wider than IX. ♀ without lateral lobes of VI.

Description. Head subglobose, slightly longer than wide, armed with two spines (♂) or lobes (♀). Eyes projecting hemispherically. Scapus roundly rectangular, pedicellus half (♂) or two-thirds (♀) as long and two-thirds as wide. Antennae reaching the abdominal segment IV (♂) or II (♀). Prothorax as long as head, slightly narrower. Mesothorax strongly elongated, slightly narrower (♂) or of equal width (♀) as prothorax, in ♂ smooth, in ♀ with few granules. Metathorax of same structure, about one-quarter as long as previous segment. Median segment considerably (♂) or slightly (♀) longer than metathorax. Profemora curved basally, triangular in cross section, laminate. Meso- and metafemora trapezoid in cross section, in ♀ slightly broadened proximally. All tibiae longer than profemora. Basitarsi of ♂ longer than following segments combined, with a low carina, probasitarsus as long as and meso- and metabasitarsus shorter than following segments combined, with a high, triangular crest. Abdominal segment II shorter than median segment. In ♂, segments II to V of similar length, VI shorter, VII shorter than VI, segments VIII to X combined slightly longer than V; segment VIII dilating, IX slightly narrower than posterior end of VIII, anterior half of X as wide as posterior half of VIII, dilated posteriorly, with a slight emargination posteriorly. Subgenital plate prominent, with a spine posteroventrally, with an acute margin posteriorly. Cerci short, straight, directed downwards. In ♀, segments II to V increasingly longer, V longest, VI as IV, VII as II, narrower than previous segments. Segments VIII to X as wide as VII, combined as long as IV; segment VIII longer than X, segment IX shorter. Posterior margin of X with a broad notch. Cerci short, straight, slightly projecting beyond X. Praeopercular organ indistinct, sternite VII with two posterolateral spines. Subgenital plate of ♀ elongated, reaching the tip of abdomen or considerably projecting, with a medioventral carina.

Egg. Capsule regularly oval, with fine punctured structure. Micropylar plate elongated, longer than two-thirds of capsule. Operculum oval. Capitulum smooth, low, with many uniform, round impressions.

Distribution. Caribbean islands, coastal areas of the Caribbean Sea.

Derivatio nominis. *Paraphanocles* shows very close relationships with *Phanocles*.

***Bostra* Stål, 1875**

Figs 8-9, 78-79

*Bostra* Stål, 1875: 13; 1875: 24; Redtenbacher, 1908: 46 (part.).

Type-species. *Bacteria turgida* Westwood, 1859: 28, pl. 8: 4 ♂, 9 ♀, by subsequent designation of Kirby, 1904: 350.

Material examined and species included. *Bostra dorsuaria* Stål, 1875: 79: ST ♂ ♀, Chiriqui (Panama), Staudinger [NHMW\*]; *Bacteria turgida* Westwood, 1859: 28, pl. 8: 4, 9: LT (by present designation) ♂, Venezuela [BMNH\*]; PLT ♀, Venezuela [BMNH\*], LT and PLT mounted on same pin; 6 ♂ ♂, 4 ♀ ♀, several eggs: Reared by O. Zompro, origin: Venezuela [OZ\*].

Complementary description. ♂ ♀. The ♂ genitalia resemble *Paraphanocles*, but *Bostra* is separated by the shorter metathorax and the different egg structure.

Head subglobose, vertex with two tubercles, spines or horns, eyes projecting hemispherically. Scapus flat, rectangular with rounded corners, pedicellus half of its length and two-thirds of its width. Antennae projecting beyond the middle of abdominal segment IV (♂) or III (♀). Prothorax as long as head, slightly narrower. Mesothorax strongly elongated, almost parallel-sided, in ♂ narrower than and in the ♀ as wide as prothorax. Mesothorax of ♀ spinose laterally. Metathorax a little longer (♂) or of similar length (♀) as median segment. Profemora curved basally, triangular in cross section, edges laminated. Meso- and metafemora trapezoid in cross section, with several small spines ventromedially. All tibiae longer than femora. Probasitarsus slightly shorter than following segments combined, mesobasitarsus as long as three following segments and metabasitarsus slightly shorter than four following segments (♂) or as long as three following segments combined. Tarsal segments slightly carinated dorsally. Abdominal segment II as long as median segment, segments II to V increasingly longer, VI = IV, VII = II. Segments VIII to X combined as long as III. In ♂, segment VIII half as long as VII, dilated posteriorly, segment IX longer, lateral margins broadened, therefore much wider than VIII. Segment X shorter than VIII, slightly emarginated posteriorly, considerably narrower than IX, with a prominent median carina dorsally. Subgenital plate flat, broad, not projecting beyond IX, posterior margin slightly emarginated. In ♀, segment IV widest, V longest, segment VIII longer than X, latter longer than IX, emarginated posteriorly. Praeopercular organ produced. Subgenital plate flat, broad, reaching the end of X, posterior half with a ventromedian carina. Cerci short, straight, not projecting beyond X.

Egg. Capsule strikingly angular, flattened laterally, bordered laterally and dorsally by structures appearing like a wall of hairs. Operculum oval, capitulum structured similar.

Distribution. Northern half of South America.

***Alienobostra* gen. n.**

Figs 10-11, 80-81, 126-127

Type-species. *Calynda brocki* Hausleithner, 1987: 177, figs. 1-2, 5-6, by present designation.

Material examined and species included. *Bostra amplexens* Redtenbacher, 1908: HT ♂, Cache, Costa Rica. [BMNH\*]; *Calynda brocki* Hausleithner, 1987: 177, figs. 1-2, 5-6: HT ♂, PT 2 ♂ ♂, 3 ♀ ♀, Costa Rica. [NHMW\*]; ♂ ♀, several eggs: Zucht O. Zompro [OZ\*]; *Bostra jugalis* Rehn, 1905: 72: ST ♂ ♀, Chinandega, Nicaragua, Coll. Baker. [ANSP\*].

Diagnosis. ♂ ♀. The morphology of the strongly elongated and curved ♂ cerci is unique in the *Phanocles* group, the vomer with its two appendices is striking and unknown in any other member of Diapheromerinae; the short median segment likewise different from all other members of this group. The structure of the egg capsule shows relationship with the following *Bacteria* group.

Description. Smaller members of the *Phanocles* group. Head flat, longer than wide, narrowed posteriorly. Vertex of ♀ bispinose. Scapus flat, roundly rectangular, pedicellus half (♂) or one-third (♀) of its length and half as wide. Antennae comparatively short, reaching the end of abdominal segment III (♂) or the end of metathorax (♀). Pronotum as long as head, slightly narrower. Mesothorax strongly elongated, narrower than prothorax, smooth and unarmed (♂) or of equal width and tuberculate to spinose laterally (♀). Metathorax structured as previous segment, distinctly shorter than its half. Profemora curved basally, triangular in cross section and laminate. Meso- and metafemora trapezoid in cross section, in ♀ with several small spines ventro-apically. All tibiae longer than femora, basitarsi as long as following segments combined. Median segment slightly shorter than metathorax, of same length as abdominal segment II. Segments II to V of ♂ of similar length, in ♀ increasingly longer, V being widest. Segment VI shorter than V, segment VII shorter than VI. Segments VIII and IX of ♂ combined as long as V, of same length, VIII posteriorly dilating, IX inserted at an angle, narrowed posteriorly, touching ventroposterolaterally. Segment X shorter than IX, in anterior half dilated, posterior half parallel-sided, with two teeth posterolaterally. Cerci longer than VII, curved in proximal one-third and flattened in apical half. Vomer in the type with two appendices. Subgenital plate small, almost hidden inside tergite IX. Segments VIII to X of ♀ of equal width, VIII longer than IX, latter as long as X. Cerci straight, shorter than X. Subgenital plate elongated, projecting beyond tip of abdomen by length of VIII to X.

Egg. Capsule suboval, smooth, with grey, white or black spots. Micropylar plate oval, half as long as capsule, inserted at an angle of 70°; median line present. Operculum round, capitulum slightly shorter than half of capsule, with longitudinal impressions.

Distribution. Middle America.

Derivatio nominis. The name *Alienobostra* wants to show the relations to *Bostra* and to point out the striking differences in structure of the genitalia.

Comments on the type. Hausleithner (1987: 185) presents notes on the culture of *Calynda brocki*. This species only differs from *Bostra jugalis* Rehn, 1905 in parts of the colouration, and the length of the ♀ subgenital plate; therefore it might be a synonym. As *B. jugalis* could only be examined from a colour print, a final decision must wait for a revision at the species level. Another possible identic species is *Bostra amplexens* Redtenbacher, 1908. If these species will be found to be synonymous, *Alienobostra jugalis* (Rehn, 1904), is the correct name of the type-species. *Calynda brocki* is chosen now, because both sexes and egg of this species could be examined.

**Bacteria group**

Genera. *Bacteria* Latreille, Le Peletier, Audinet-Serville & Guérin, 1827 (= *Pseudobacteria* Saussure, 1870); *Calynda* Stål, 1875; *Globocalynda* gen. n.; *Paracalynda* gen. n.

Characteristics. Median segment very short. Cerci distinctly but at best slightly projecting beyond tip of abdomen, never specialized. Tarsal segments lacking high carinae or crests. Vomer produced.

In the egg space between micropylar plate and operculum convex in outline, not concave.

**Key to the genera of the *Bacteria* group**

♂ ♂:

- 1 Abdominal segments VIII to X globose. . . . . *Globocalynda*
- Abdominal segments VIII to X forming no globose structure. . . . . 2
- 2 Posterior part of abdominal tergite X curved upwards. . . . . 3
- Posterior part of abdominal tergite X straight, not curved upwards. *Paracalynda*
- 3 Abdominal tergites VIII to X of similar width. . . . . *Calynda*
- Abdominal tergites from VIII to X dilating. . . . . *Bacteria*

♀ ♀:

- 1 Head not armed, smooth. . . . . 2
- Head armed. . . . . *Calynda*
- 2 Subgenital plate not projecting beyond tip of abdomen. . . . . 3
- Subgenital plate projecting considerably beyond tip of abdomen. *Globocalynda*
- 5 Abdominal segment VIII of similar length as IX and X. . . . . *Paracalynda*
- Abdominal segment VIII as long as IX and X combined. . . . . *Bacteria*

Eggs:

- 1 Capsule not punctured, with leather-like structure or smooth (20 x) . . . . . 2
- Capsule punctured (20 x) . . . . . 3
- 2 Capsule with irregular spots of darker colouration laterally. . . . . *Paracalynda*
- Capsule monochromous laterally. . . . . *Bacteria*
- 3 Capsule bullet-like, considerably longer than high. . . . . *Calynda*
- Capsule almost quadrate, slightly longer than high. . . . . *Globocalynda*

***Globocalynda* gen. n.**

Figs 12-13, 82-83, 126-127

*Calynda*: Brunner v. W., 1907: 328 (part.)

Type-species. *Calynda simplex* Brunner v. W., 1907: 329, by present designation.

Material examined and species included. *Calynda simplex* Brunner v. W., 1907: 329: LT ♂ (here selected), Callanga, Peru, Staudinger. Collection Brunner v. W. det. Brunner v. W. *Calynda simplex* Br.: 22.572 [NHMW\*]; PLT ♀, 2 eggs ex abdomen, Coll. Brunner v. W., Songo (Bolivia), Staudinger. det. Brunner v. W. *Calynda simplex* Br.: 22.250 [NHMW\*]; *Calynda unilobata* Brunner v. W., 1907: 330: ST ♂ ♀ [NHMW\*].



Diagnosis. ♂ ♀. Very characteristic by the globose terminal segments of the abdomen of the ♂, in this feature differing strikingly from the related genera. The long median segment shows relations to the previous group, but the simple tarsal segments and the morphology of the egg clearly make *Globocalynda* placed within the *Bacteria* group.

Description. Head a little longer than wide, flat, smooth, scapus roundly rectangular, pedicellus subglobose, of half-length and two-thirds of width of previous segments. Antennae reaching the abdominal segment VII (♂) or III (♀). Prothorax as long as head, in / slightly narrower. Mesothorax strongly elongated, narrower than prothorax (♂) or equally dilated posteriorly, 2.5 (♂) or 2 times (♀) as long as metathorax. Profemora slightly curved basally, depressed laterally, triangular in cross section, edges prominently laminated. Probasitarsus longer than (♂) or of equal length (♀) as following segments combined. Meso- and metafemora trapezoid in cross section, mesobasitarsus longer than (♂) or as long as four following segments without unguis (♀) combined, metabasitarsus considerably longer than (♂) or as long as (♀) following segments combined. All tibiae longer. Abdominal segment II less than twice as long as median segment, III slightly longer, IV longer than III, segment V longer than IV, segment VI as long as II (♂) or V (♀). Segment VII shorter than (♂) or as long as II (♀). Segments VIII to X of ♂ combined as long as VII, segment VIII as long as X, segment IX longer than VIII or X. Segments VIII to X combined globose. Segment VIII dilated posteriorly, IX as wide as posterior part of IX, segment X considerably narrower, posterior margin notched, with a triangular keel medially. Cerci straight, directed downward. Subgenital plate of ♂ reaching the middle of X, posterior part straightly upturned. Vomer simple. Segment VIII of ♀ almost as long as IX, segment X considerably shorter. Subgenital plate strongly elongated, broad, with a ventromedian carina.

Egg. Capsule from lateral view roundly rectangular, flattened dorsoventrally, shiny, black, with leather-like structure (20x). Micropylar plate elongated, two-thirds of length of capsule, parallel-sided, marginated, surrounded by a white area more than twice as wide as margin. Median line present, reaching the polar area. Capitulum flat.

Distribution. NW South America.

Derivatio nominis. The name derives from the morphology of the abdominal segments VIII to X in the ♂ and shows the close relationship with *Calynda* Stål.

***Bacteria*** Latreille, Le Peletier, Audinet-Serville & Guérin, 1827      Figs 15-16, 84-85

*Bactérie*: Latreille, 1825: 412; *Bacteria*: Latreille, Le Peletier, Audinet-Serville & Guérin, 1827: 445; Burmeister, 1838: 563 (part.); Westwood, 1859: 20 (part.); Kirby, 1904: 355 (part.); Brock, 1998c: 33; *Pseudobacteria*: Saussure, 1870: 157; Kirby, 1904: 346 (part.); *Dyme*: Brunner v. W., 1907 (part.); *Bostra*: Redtenbacher, 1908: 406 (part.); nec *Bacteria*: Stål, 1875: 6, 14; 1875: 29; 1875: 11; Rehn, 1904: 61; Redtenbacher, 1908: 412; Shelford, 1909: 362.

Type-species. *Mantis ferula* Fabricius, 1793: 12, by subsequent designation of Kirby 1904c: 346.

Material examined and species included. *Mantis ferula* Fabricius, 1793: 12: ♀, Guadeloupe Mus. Seh. & T. L. *Ferula* F. = *Antillarum* Saussure & *Arumatia* Stoll [ZMUC\*]. This specimen might be Fabricius's HT, but it is difficult to find evidence for this statement, as it was labelled subsequently; ST of *Bacteria antillarum* Saussure, 1868: 65: ♂ ♀, one egg ex ovipositor, Guadeloupe, Schramm; ST 2 ♂ ♀, Guadeloupe, H. d. Saussure; ST ♀, Guadeloupe, coll. Guérin [MHNG\*]; *Pseudobacteria donskoffi* Lelong & Langlois, 1998: 248, figs. 10-15 [MNHN].

Complementary description. ♂ ♀. *Bacteria* is closely related to *Calynda* Stål, but differs in the very short subgenital plate, the short cerci, the flattened head and the terminal tergite of the ♂, in which the posterior part is elevated as a bulge. The vomer lacks an apex.

Large members of this group. Head longer than wide, smooth, unarmed. Scapus flat, pedicellus half as long, round. Antennae reaching the posterior end of abdominal segment IV (♂) or I (♀). Prothorax as long and wide as head. Mesothorax strongly elongated, smooth, as wide as prothorax (♂) or gently widened proximally (♀); metathorax structured like previous segment, but only half as long. Profemora curved basally, with one high keel dorsally and ventrally, with one less prominent keel interiorly; protibiae shorter, probasitarsus longer (♂) or as long (♀) as following segments combined. Meso- and metafemora four-edged, with a more or less prominent spine ventro-apically. Meso- and metabasitarsus in both sexes of same length as following segments combined. Median segment less than one-fifth as long as metathorax. Segments II to IV of similar length; segment IV widest in ♀. Segment VII slightly shorter than VI. Terminal segments of ♂ from VIII to X dilated, of similar length, posterior margin of X with a prominent edge (no margin as in the other groups), this edge separated from lateral margin of this segment. Supra-anal plate hidden under the edge. Vomer transverse, prominent apex absent. Cerci elongated, strongly curved, as long as X. Subgenital plate bulgy, marginated posteriorly. Segment VIII of ♀ almost as long as IX and X combined, segments IX and X of equal length. Last three segments narrower than those before, of same width. Supra-anal plate very short, indistinctly projecting beyond X. Cerci strong but short, half as long as X. Subgenital plate blunt, not projecting beyond X.

Egg. Capsule oval, smooth, lacking any structure (50 x), capitulum regularly punctured. Micropylar plate elongated, three-quarters as long as capsule, with a short median line, surrounded by a white area.

Distribution. Caribbean islands.

Comments on the genus. Rehn (1904: 61) corrected the name of the author "Latreille, 1825". This author used the name only in the French form "*Bactérie*". Latreille, Le Peletier, Audinet-Serville & Guérin were the first to use the latinized form "*Bacteria*" and are consequently the authors. They adopted Latreille's diagnosis without completing it. The confusion in the use of the name *Bacteria* is discussed by Brock (1998c: 33). Brock was correct to synonymize *Bacteria* with *Pseudobacteria*, examining the exact identity of the type-species; as a result the formerly large *Bacteria* includes only two species now, while most of the species formerly assigned in this genus have to be transferred to other genera. Many of them will obviously warrant erection of new genera, for the bulk are definitely heterogenous, making it impossible

to incorporate them in already existing genera. Some are currently members of the new genus *Phanocloidea*. A revision at the species level is thus badly needed.

Comments on the type-species. Kirby selected *Bacteria antillarum* Saussure, 1868, as type-species of *Pseudobacteria* Saussure, which is an objective synonym of *Bacteria ferula* (Fabricius, 1793).

As formerly *Bacteria* was one of the largest genera in Phasmatodea, a full list of citations and synonymy of the type-species seems helpful:

*Mantis ferula* Fabricius, 1793: 12; *Phasma ferula*: Fabricius, 1798: 187; Lichtenstein, 1802: 10 (part.); *Bacteria ferula*: Latreille, Le Peletier, Audinet-Serville & Guérin, 1828: 445; Burmeister, 1838: 564; Kirby, 1904c: 355; Brock, 1998c: 33.

*Bacteria arumatia*: Westwood, 1859: 22 (not pl. 23: 4 „var.“).

*Bacteria crudelis* Westwood, 1859: 24 (synonymized by Brock, 1998c: 33);

*Pseudobacteria crudelis*: Kirby, 1904: 346; *Bostra crudelis*: Redtenbacher, 1908: 409.

*Bacteria antillarum* Saussure, 1868: 65; *Pseudobacteria antillarum*: Saussure, 1872: 157 (synonymized by Kirby, 1904: 346); *Dyme antillarum*: Brunner v. W., 1907: 328.

### *Calynda* Stål, 1875

Figs 17-18, 86-87

*Calynda* Stål, 1875: 24; Rehn, 1904: 57; Kirby, 1904: 353; Brunner v. W., 1907: 328 (part.); Shelford, 1909: 349; Hausleithner, 1987: 177.

Type-species. *Calynda bicuspis* Stål, 1875, by monotypy.

Material examined and species included. *Calynda bicuspis* Stål, 1875: 78: HT ♀ [NHRS\*] (The ♂ mentioned by Sjöstedt (1933: 5) is a ♀); ♀, Chiriqui, Staudinger [NHMW\*]; ♀, Cache, Costa Rica, H. Rogers [NHMW\*]; *Calynda coronata* Carl, 1913: 34: ST ♀, Costa Rica, San Jose, 1161 m [MHNG\*]; ST ♀, San Carlos, 250 m, Biolley [MHNG\*]; *Dyme discors* Brunner v. W., 1907: 324: LT ♂ (here selected), Coll. Br. v. W., Chiriqui. (Panama) Staudinger [NHMW\*]; 4 PLT ♂♂: Panama, Vale de Chiriqui, leg. Champion [BMNH\*].

Complementary description. ♂ ♀. This genus is well defined within this group by the morphology of the ♂ genitalia and the head of the ♀ being armed.

Medium to large members of the *Bacteria* group. Head a little longer than wide, narrowed proximally, vertex of ♀ armed in its anteromedian part. Scapus flat, pedicellus round, half as long as scapus, following segments elongated. Antennae reaching the middle of abdominal segment VII (♂) or IV (♀). Prothorax parallel-sided, longer than head. Mesothorax strongly elongated, as wide as prothorax. Metathorax considerably shorter than previous segment, of similar width and same structure. Profemora curved basally, with one dorsal, one ventral and one interior keel. Tibiae longer than femora. Basitarsus longer (♂) or as long as (♀) following segments combined. Basitarsus of ♀ with a dorsomedian carina. Meso- and metafemora unarmed (♂) or in basal quarter with exteriorly directed lobes dorsolaterally (♀), with one or more very small spines ventro-apically. Meso- and metabasitarsus about as long as length of following segments combined, that of ♀ with a dorsal carina. Median segment less than 1/10 (♂) or 1/3 (♀) as long as metanotum. Abdominal segment II 5 (♂) or 2 times (♀) as long as median segment. Segments II to VI of ♂ of similar length, III



of ♀ longer than II, of same length as IV to VI. Segment VII in both sexes shorter than previous segment. Sternite VII of ♀ with a small praeopercular organ. Segments VIII to X of ♂ wider than previous segments, VIII widened distally, trapezoid, longer than X but shorter than IX, latter as wide as X but twice as long, X emarginated posteriorly, lobes upcurved, with several black teeth ventrally, margin absent. Supra-anal plate projecting, triangular. Vomer broad, triangular, with one apex. Cerci long, curved, projecting beyond tip of abdomen by length of IX. Segments VIII to X of ♀ of similar length and width, supra-anal plate broad, triangular. Cerci straight, as long as X. Subgenital plate elongated, projecting beyond tip of abdomen, with a notch posteriorly, carinate ventrally.

Egg. Capsule flattened bullet-like, smooth, dark brown with leather-like structure (50 x). Micropylar plate half as long as capsule, surrounded by a wide, white area covering its posterodorsal part, parallel-sided, with a broad, flat margin and a median line.

Distribution: Central America.

Comments on the genus. Brunner v. W.'s note (1907: 328) "Dieses Genus unterscheidet sich von *Dyme* nur durch das lange Operculum. Das einzige bekannte Männchen ist mit Ausnahme der geschwellenen letzten Hinterleibssegmente von *Dyme* nicht zu unterscheiden." is inaccurate and based on his handling of *Dyme*, a genus in which he included several highly heterogeneous species. Hausleithner (1987: 178) calls the diversity in the length of the median segment "ein nicht unwesentliches Unterscheidungsmerkmal der *Calynda*-Arten". In fact it is of generic value; in his work, just like in Brunner's, there is no hint concerning the type-species *C. bicuspis* Stål. Windsor et al. (1996) report dispersal of the eggs by ants in this species, but their phasmid is definitely an undetermined species of *Phanocloidea*.

The diagnosis of *Calynda* is completed by the yet undescribed ♂♂ of *C. coronata* Carl, 1915 and *C. discors* (Brunner v. W., 1907) comb. n.

### *Calynda coronata* Carl, 1913, ♂

Fig. 18

Material examined: ♂, Costa Rica, Monteverde, Nebelwald, 10°17'53" N 84°48'14" W, 1500m, 17.II.1998, leg. I. Richling [OZ 386-3\*].

Description. General colour light brown, body shiny. Head smooth, not armed, distinctly longer than wide, narrowed posteriorly, widest across eyes, these projecting slightly more than hemispherically. Genae black, with a white stripe dorsally, vertex brown, posterior half darker. Ventral part of head white. Scapus club-like, distally broadened, brown, with an elongated, black triangle anteroventrally. Pedicellus half as long, globose, slightly narrower, brown, darker ventrally. Following segments elongated, black ventrally, posterior ends annulated up to middle of antennae, lighter from middle to apex. Antennae reaching the middle of abdominal segment VII. Prothorax slightly shorter than head, lateral margins convex, median longitudinal impression and median transverse furrow present. Mesothorax slightly narrower than prothorax, 7 times as long, smooth. Metathorax like previous segment, two-thirds as long. Profemora strongly curved basally, curved part light green, following part light brown, triangular



in cross section, laminate. Protibiae distinctly longer, quadrate in cross section, probasitarsus distinctly longer than following segments combined, segment II as long as III and IV combined, III twice as long as IV. Terminal segment as long as II. Meso- and metafemora trapezoid in cross section, with a row of some small granules ventro-apically, tibiae black in proximal part, then light brown. Mesobasitarsus slightly shorter, metabasitarsus as long as following segments combined. Median segment very short, abdominal segment II 6 times as long. Abdominal segments light brown, smooth. Length of II to V slightly increasing, VI shorter than II, segment VII shorter than VI. Segments VIII to X combined slightly longer than V. Segment IX longer than VIII, segment X about two-thirds of IX. Both IX and X as wide as II, segment VIII dilated posteriorly, therefore slightly wider. Segment X posteriorly with a broad notch. Supra-anal plate small, not projecting beyond X, but visible in the notch, white. Cerci as long as X, projecting, curved before apex. Subgenital plate flat, broadly margined posteriorly. Vomer sulcate ventrally, with a short, black apex.

Measurements (mm). Body: 76.2; head: 3.2; pronotum: 3.0; mesonotum: 21.0; metanotum: 14.0; median segment: 0.9; profemora: 27.5; protibiae: 36.2; mesofemora: 23.0; mesotibiae: 28.5; metafemora: 28.3; metatibiae: 38.1.

***Paracalynda* gen. n.**

Figs 19-20, 88-89, 130-131

Type-species. *Bacunculus pictus* Brunner v. W., 1907: 333, by present designation.

Material examined and species included. *Bacunculus pictus* Brunner v. W. 1907: 333: HT ♂, Coll. Brunner v. W., Guatemala, Godman [NHMW\*]; *Pseudobacteria picta utilaensis* Zompro, 1998: 215, fig. 6-8: HT ♂, PT 2 ♂♂, 2 ♀♀, ♂ nymph IV, ♀ nymph V, several eggs, Honduras, Utila Id., III.1997, leg. T. Kujawski [OZ 323-1 - 7\*].

Diagnosis. ♂ ♀. This genus is a typical member of this group, even so relations to the next group are evident: the genitalia resemble those of *Diapheromera*, the specialized antennae that in *Manomera*. The eggs are typical for the Bacteria group.

Description. Medium to large-sized members of the *Diapheromera* group (see below), ♂ comparatively colourful. Body surface smooth. Head distinctly longer than wide. Scapus very flat, pedicellus cylindrical, half as long and two-thirds as wide as scapus. First antennal segments comparatively strong, antennae projecting beyond tip of abdomen (♂) or reaching the end of abdominal segment V (♀). Prothorax as long as head and of same width. Mesothorax highly elongated, narrower than prothorax (♂) or of same width (♀). Metathorax about two-thirds of length of mesothorax. Profemora curved basally, triangular in cross section, probasitarsus distinctly longer (♂) or of same length (♀) as following segments combined. Meso- and metafemora trapezoidal in cross section, ventro-apical spines absent, mesobasitarsus as long as (♂) or shorter (♀) than following segments, metabasitarsus longer than (♂) or of equal length (♀) as following segments combined. Metanotum 8 (♂) or 4 times (♀) as long as median segment. Abdominal segment II a little more than twice as long as median segment, III to VI of equal length, longer than II (♂) or III longer than II, segments IV to VI of equal length, longer than III (♀). Segment IV of ♀ widest, II to VII of ♂ of equal width. VII of ♀ as long as III, VII of ♂ shorter than II. Segment VIII of ♂ dilated

caudally, wider and longer than IX and X. Both latter of equal length. Segment X wider than IX, dilated and emarginated posteriorly. Segments IX and X closed ventrally, vomer reduced, not visible. Subgenital plate small, not projecting beyond segment IX. Segments VIII to X of ♀ of same width, narrower than previous segments, VIII and X of equal length, IX shorter, X emarginated, posterior half with a keel, supra-anal plate triangular. Subgenital plate slender, slightly projecting beyond tip of abdomen. Cerci of ♂ very long, with one big tooth basally, curved; of ♀ straight, longer than X.

Egg. Capsule very shiny, smooth, oval, flattened laterally. Micropylar plate almost reaching the operculum, broadly marginated. Capitulum flat, punctured deeply and regularly. Median line almost as long as micropylar plate.

Distribution. Central America.

Derivatio nominis. Related to *Calynda*.

### ***Diapheromera* group**

Genera. *Diapheromera* Gray, 1835; *Manomera* Rehn & Hebard, 1907; *Megaphasma* Caudell, 1903; *Diapheromera* (*Rhabdoceratites*) Rehn & Hebard, 1912 = *Diapheromera* (*Ceratites*) Rehn & Hebard, 1909; = *Diapheromera* (*Ceratita*) Strand, 1926).

Characteristics. The spination of the femora separates the *Diapheromera* group from the related generic groups. The structure of the ♂ genitalia shows relation to the following groups, while the sponge-like capitulum of the eggs resembles the *Bacteria* group.

Small to medium-sized Diapheromerini, body strikingly shiny. Femora spinose ventro-apically, abdominal tergite X of ♂ closed by sternite X ventrally, vomer not produced. Eggs with a sponge-like capitulum.

### **Key to the genera of the *Diapheromera* group**

♂ ♂:

- 1 Abdominal segment VIII as wide as X. . . . . 2
- Abdominal segment X wider than VIII. . . . . *Megaphasma*
- 2 Meso- and / or metafemora broadened. . . . . 3
- Meso- and / or metafemora built normally, not broadened. . . . . *Manomera*
- 3 Head depress, longer than wide. . . . . *Diapheromera s. str.*
- Head globose. . . . . *Diapheromera* (*Rhabdoceratites*)

♀ ♀:

- 1 Cerci elongated, projecting beyond abdomen at least by the length of tergite X. . . . . *Manomera*
- Cerci not projecting beyond abdomen so strongly. . . . . 2
- 2 Head prognathous. . . . . 3
- Head almost orthognathous . . . . . *Megaphasma*
- 3 Head unarmed. . . . . *Diapheromera s. str.*
- Head armed with short horns. . . . . *Diapheromera* (*Rhabdoceratites*)

## Eggs:

- 1 Anterior margin of capsule surrounded by hairs, capitulum strongly elevated ..... *Megaphasma*  
 - Anterior margin of capsule not surrounded by hairs. .... 2  
 2 Capsule not shiny. .... *Manomera*  
 - Capsule shiny. .... *Diapheromera*

***Manomera* Rehn & Hebard, 1907**

Figs 21-22, 90-91

*Manomera* Rehn & Hebard, 1907: 283; *Bacunculus*: Scudder, 1900: 95; Caudell, 1903: 872.

Type-species. *Bacunculus tenuescens* Scudder, 1899, by monotypy.

Material examined and species included. *Manomera tenuescens* (Scudder 1899: 95, pl. 1: 1, 2): HT ♂ [ANSP]; ♀, Alachua Co., Fla, XI.10.1922, F. W. Walker [DEIC\*]; ♀, Coll. Brunner v. W., Georgia, Morrison leg. [NHMW\*]; 2 ♂♂, 4 ♀♀, several eggs, USA, Fla, Gainesville, 07.VI.1997, leg. E. Tilgner & E. Lewis [OZ 385-1 - 6\*]; *Bacunculus blatchleyi* Caudell, 1905: 212; *Manomera blatchleyi atlantica* Davis, 1923: 53, pl. 10: 1-4: HT ♀, Clove Valley, Staten Island, N. Y., September 9, 1893 [AMNH\*]; *Manomera brachypyga* Rehn & Hebard, 1914: 384: 2, 4: HT ♂, Homestead, Dade Co., Florida, July 10-12, 1912; AT ♀, Miami, Dade Co., Florida, March 28, 1910 [ANSP\*].

Complementary description. ♂♀. Slender and elongated members of the *Diapheromera* group. Characterized by the slender and elongated head which is at least 2 times as long as wide, the femora which are not broadened and the thick first segments of the antennae, the latter feature showing relationship with *Paracalynda* of the previous group. The ventro-apical spines of the femora are sometimes indistinct, but not lacking as mentioned by Rehn & Hebard (1907).

Very slender, medium-sized members of the *Diapheromera* group. Head elongate, twice as long as wide, greatest width at eyes, equally narrowed proximad. Scapus slightly flattened, of same width and double length as pedicellus, first segments of antenna broad, almost as wide as pedicellus. Antennae reaching the anterior half of abdominal segment VII (♂) or IV (♀). Body smooth. Pronotum a little more than half-length of head and width of its posterior margin. Mesonotum strongly elongated, narrower than pronotum and parallel-sided (♂) or of same width and equally dilated (♀), mesonotum more than two-thirds of its length. Profemora curved basally, triangular in cross section, tibiae longer, probasitarsus longer than (♂) or of equal length as (♀) following segments combined. Mesofemora with one prominent (♂) or one indistinct spine (♀) ventro-apically, mesofemora with one indistinct spine in both sexes. Mesobasitarsus of same length (♂) as or shorter (♀) than following segments combined, metabasitarsus slightly longer (♂) or shorter (♀) than following tarsal segments combined. Metanotum more than 8 (♂) or 5 times (♀) longer than median segment. Abdominal segment II more than 3 (♂) or 2 (♀) times longer than median segment, II longer than III to VI, these of similar length (♂) or II as long as VI and VII, segments III to V of similar length but longer than II, VI or VII (♀). Segments II to VII in ♂ of same width, in ♀ IV widest. Segments VIII to X of ♂ of same width, VIII as long as IX, segment X 1.5 times longer than IX, slightly emarginated posteriorly; X almost closed ventrally, vomer reduced, not visible, cerci as long as X, curved, directed

downward. Subgenital plate very flat. Segments VIII and IX of ♀ of same length, X almost 1.5 times as long as IX. Cerci as long as X, straight, inserted horizontally. Subgenital plate not projecting beyond IX.

Egg. Capsule flattened bullet-like, in lateral view roundly rectangular, with leather-like structure (50 x) and grey-white colour, not shiny. Micropylar plate parallel-sided, elongated, almost reaching the operculum, median line present. Capitulum flat, sponge-like, with several invaginations.

Distribution. Southern USA.

*Diapheromera* Gray, 1835 (s. str.)

Figs 23-26, 92-93

*Diapheromera*: Gray, 1835: 18; Westwood, 1859: 20; Saussure, 1870: 165; Stål, 1875: 7, 13; 1875: 21; Caudell, 1903: 873; Rehn, 1904: 50; Kirby, 1904: 346; Brunner v. W., 1907: 337; Shelford, 1909: 353; Hebard, 1934: 281; 1943: 299; Günther, 1953: 561.

Type-species. *Spectrum femoratum* Say, 1824: 297, by monotypy.

Material examined and species included. *Diapheromera arizonensis* Caudell, 1903: 877 [USNM]; *Bacunculus calcarata* Burmeister, 1838: 566: HT ♂, Mexico, Deppe [ZMHB\*]; *Diapheromera dolichocephala* Brunner v. W., 1907: 338: ST ♀, Texas, Boll leg. [NHMW\*]; *Diapheromera erythropleura* Hebard, 1923: 192: HT ♂, Venvidio, Sinaloa, Mexico, IX.2.1912 (J. A. Kusche); AT ♀, ♂, Venvidio, Sinaloa, Mexico, VIII.1918 (J. A. Kusche) [ANSP\*]; *Spectrum femoratum* Say, 1824: 297: HT ♂, E. Doubleday, Illinois [OXUM\*] = *Diapheromera sayi* Gray, 1835: 18: HT ♀, N. America [BMNH\*]; 5 ♂♂, 6 ♀♀, several eggs, Reared by O. Zompro [OZ 147-1 - 10\*]; 1 ♂, Missouri, Springfield, leg. Muche, ex coll. SMTD [OZ 147-11\*]; *Diapheromera nitens* Brunner v. W., 1907: 338: ST ♀, Mexico, Procopp [NHMW\*]; *Bacunculus texanus* Brunner v. W., 1907: 333: ST ♂, Texas, Boll leg. [NHMW\*], ST ♀, Dallas, Texas [NHMW\*]; ST ♀, New York [MNHN\*]; *Diapheromera torquata* Hebard, 1934: 281, pl. 20: 1-3: HT ♂, Lost Mine, Chisos Mts., Texas [ANSP\*].

Complementary description. ♂♀. Small to medium-sized members of this group. Body smooth and, especially in ♂, shiny. Head subglobose, flat dorsally, slightly longer than wide. Scapus flattened, pedicellus a little more than half of its length, cylindrical. Antennae almost reaching the end of abdomen (♂) or projecting beyond abdominal segment III (♀). Prothorax as long as head and as wide as head's posterior part. Mesothorax as wide as prothorax, dilated toward mesocoxae. Metathorax barely shorter than mesothorax. Median segment one-fifth as long as metathorax. Profemora curved basally, triangular in cross section, comparatively thick; protibiae slightly longer, probasitarsus of similar length as following segments combined. Mesofemora of ♂ considerably, of ♀ slightly broadened, not projecting beyond abdominal segment II. Metafemora slightly broadened (♂) or built like mesofemora (♀), meso- and metafemora with one prominent (♂) or small (♀) spine ventro-apically. Mesobasitarsus as long as following three combined, metabasitarsus as long as following four segments without unguis combined. Median segment a little longer than one-third of abdominal segment II. In ♂, segments II to V longer than previous one, VI as long as II, segment VII shorter. Segments II to VII almost parallel-sided or equally indistinctly narrowed. Segment VII narrowed in the middle. VIII wider, as wide as X, both wider than IX. Segments VIII and X of similar length, IX considerably shorter.



Segment X without posterior margin. Cerci elongated, curved. Subgenital plate small, shorter than IX. Margins of tergites VIII to X turned downward, narrowed ventrally. Sternite X present, not produced as a vomer, but integrated in X so that the segment appears as a closed tube. Segment II of ♀ slightly shorter than III, segments III to V of similar length, IV as long as II, segment VII shorter. Segments II to IV widened, latter widest, IV to VII equally narrowed. Posterior part of margin of VII turned downward, edges almost in touch ventrally. Segment VIII shorter than X, both longer than IX, all of similar width. Segment X with a notch posteriorly, supra-anal plate projecting, roundly triangular. Cerci thick, short, straight, subgenital plate slightly projecting beyond IX.

Egg. Capsule flattened bullet-like, shiny, surface with indistinct leather-like structure (50 x). Micropylar plate elongated, slender, half as long as capsule; a strong median line present. Capitulum sponge-like, with big holes, colourful, flat hemispherical.

Distribution. Southern Canada, USA, Mexico.

Comments on the type-species. The type-species is one of the best known of all phasmid species. It reaches Canada in the North and is one of the globe's most boreal stick insects. Both sexes vary a lot in their body size.

***Diapheromera* (*Rhabdoceratites*) Rehn & Hebard, 1912**

Figs 25-26

*Rhabdoceratites* Rehn & Hebard, 1912: 232; *Ceratites* Rehn & Hebard, 1909: 126; *Ceratita* Strand, 1926: 46.

Type-species. *Diapheromera* (*Ceratites*) *covilleae* Rehn & Hebard, 1909, by original designation.

Material examined and species included. *Diapheromera* (*Rhabdoceratites*) *covilleae* (Rehn & Hebard, 1909: 126, fig. 5): HT ♂, PT ♀, Franklin Mountains, altitude 4500ft, El Paso, El Paso County, Texas, VII. 9, 1907, [ANSP\*]; *Diapheromera beckeri* Kaup, 1871: 27: HT ♂, Mexico [HLDH\*].

Comments on the subgenus. Only a few species of *Diapheromera s. l.* could be examined, but the comparatively more globose head and its armature seem to be of taxonomic importance and justify the subgeneric rank. The type-species, examined from a colour-print of P. Brock, looks like a typical *Diapheromera* and the lack of horns in the *tamaulipensis* ♂ mentioned by Rehn & Hebard (1909) does not entirely look like "purely accidental". In phasmids one sex often possesses horns and in the other these are absent, mostly in the ♂. Rehn & Hebard (1909) mention *D. bidens* Kaup as a member of this subgenus; in fact it is a member of *Sermyle* Stål, as is *D. saussurei* Kirby.

Distribution. Southwestern USA and Mexico.

*Megaphasma* Caudell, 1903

Figs 27-28, 94-95

*Megaphasma* Caudell, 1903: 878; Kirby, 1904: 347.Type-species, *Diapheromera dentricus* Stål, 1875, by monotypy.

Material examined and species included. *Diapheromera dentricus* Stål 1875: 76: HT ♀, Louisiana [NHRS\*]; ♂ ♀, Texas [MHNG\*]; ♂ ♀: SW-Texas, leg. Lehmann, 7.1994 [F. H. Hennemann 43-1, 2\*]; ♂, USA, California, Los Angeles, Baton Rouge, 15.VIII.1968, leg. K. Odom; ♀, USA, California, Los Angeles, Baton Rouge, East B. R. Parish, 13.VI.1981, leg. M. L. Israel; 1 egg, USA, Arkansas, in leaf litter [OZ 72-1, 2\*]; *Diapheromera furcata* Brunner v. W. 1907: 338: LT (here designated) ♂, Venta de Zopilote, Guerrero, 2800ft, June. H. H. Smith; Collectio Br. v. W.; det. Br. v. W. *Diapheromera furcata*; 23.855 [NHMW\*].

Complementary description. ♂ ♀. Large members of this group. Head globose, slightly longer than wide. Head orthognathous. Eyes projecting hemispherically. Ocelli indistinct. Scapus flat, rectangular, longer than wide, pedicellus cylindrical, almost as wide as scapus; antennae reaching the posterior margin of abdominal segment V (♂) or II (♀). Body, especially of ♂, very shiny and colourful. Prothorax of same length as head, narrower. Mesonotum elongated, posterior quarter widened toward coxae, this segment of same length and structure as metanotum. Meso- and metatergum with an indistinct (♂) to very clear (♀) median line. Profemora curved basally. Probasitarsus slightly shorter than following segments combined, in ♀ carinate. Meso- and meta-femora broadened, trapezoid in cross section, with a distinct to very prominent spine ventro-apically and several smaller ones medio-ventrally. Meso- and metabasitarsus shorter than following segments combined, carinate dorsally. Median segment less than one-fifth of length of metanotum. Abdominal segment II more than twice as long as median segment, slightly shorter than III. Segments III to VI of similar length, VII shorter, shorter than (♂) or as long as II (♀). Segment VIII of ♂ dilated posteriorly, posterior margin as wide as IX, latter parallel-sided, X again dilated, emarginated posteriorly. Segment VIII as long as IX, segment X longer. Segment IX closed ventrally by sternite X, latter not produced as a vomer. Cerci elongated, longer than X, spatulate or furcate. Subgenital plate very small, almost globose, with a flat posterior margin. Segment VIII of ♀ longer than IX, segment X longer than VIII. Supra-anal plate projecting, round. Cerci slightly curved, half as long as X. Praeopercular organ reduced. Subgenital plate boat-like, reaching the middle of X, ending in a projecting apex.

Egg. Capsule oval, moderately shiny, structured leather-like (50 x), micropylar plate elongated, measuring two-thirds of capsule length, widened in posterior half. Operculum surrounded by hairs and, with capitulum, both structured sponge-like, with large holes and slender supports.

Distribution. Southern USA. Northern Central America.

Comments on the genus. The validity of Caudell's genus is proved by the eggs described by Stark & Lentz (1986), which show a strongly swollen capitulum surrounded by hairs, both lacking in *Diapheromera*. As in other genera of Diapheromerini, the morphology of the ♂ cerci is only important at the species level. *Diapheromera furcata* Brunner v. W. is a typical *Megaphasma*, differing only in the cerci being furcate, not spatulate as in *dentricus*.

*Caribbiopheromera* group

Genus. *Caribbiopheromera* gen. n.

Characteristics. Small Diapheromerini. Median segment almost as long as metathorax. Body not shiny. Abdominal segments VIII and IX of ♂ completely melted, no dividing lines visible. Body of ♀ with several tubercles. Femora without ventral spines. Egg almost round, shiny, with elongated micropylar plate and sponge like capitulum.

*Caribbiopheromera* gen. n.

Figs 48-49, 96-97, 132-133

Type-species. *Caribbiopheromera jamaicana* sp. n., by present designation.

Material examined and species included. See *C. jamaicana* sp. n.

Diagnosis. ♂ ♀. The new genus shows characters of both the *Diapheromera* and *Heteronemia* groups. With the first group, it agrees in egg structure, with the second in lack of ventral spines on the femora and in the body of the ♀, which is not glossy. The abdominal tergites VIII and IX of the ? are completely fused, a tendency also visible in *Pseudosermyle* of the *Sermyle* group. Yet it differs in the length of the median segment, which is almost as long as the metanotum. The monotypic genus is endemic to Jamaica.

Small to medium-sized *Heteronemiini*. Body surface smooth (♂) or rough (♀), not shiny, with several tubercles (♀). Head scarcely longer than wide, flattened dorsally (♂) or slightly longer than wide, vertex and occiput slightly elevated, with irregular tubercles (♀). Scapus of ♂ flattened, twice as long as pedicellus, latter globose in the middle, apical and distal parts cylindrical. In ♀, scapus more strongly flattened than in ♂, only one-quarter longer than wide. Antennae of ♂ as long as body, last segments whitish, apex black, of ♀ projecting beyond the middle of abdominal segment VI. Pronotum indistinctly longer than head, in ♂ rectangular, anterior margin narrower than posterior one, in ♀ longer than broad, anterior margin wider than posterior one, granulated. Mesonotum of ♂ elongated, 5.5 times as long as pronotum, with a flat median carina, in ♀ 4 times longer than pronotum, irregularly granulated, with some larger granules, 3 times longer than metanotum, latter structured similar. Median segment two-thirds as long as metanotum. Legs slender, unarmed, metatarsi of fore- and hindlegs almost twice, of midlegs as long as remaining segments combined, in ♀ interior and exterior of mesofemora before knees with a triangular lobe. Abdominal segment II of ♂ one-third longer than I, segments II to VI of similar length, VII shorter. Segments VIII and IX fused, X short, as wide as long, posteriorly with a v-shaped notch, but not marginated. Sternite VIII globose, IX very short. Vomer very slender, black. In ♀, abdominal segments marginated. Segments II to VI of similar length, VI strongly elevated and tuberculated, VII shorter, carinate dorsally. Segment VIII half as long as VI, depressed laterally, with a median carina. Segments VIII to X more narrow, of equal width, IX half as long as VII, carinae less sharp as in VIII. Segment X as long as VIII, its apex w-shaped.

Egg. Depressed, round, smooth, shiny, with an oval, parallel-sided, whitish marginated micropylar plate and an orange operculum.

Distribution. Jamaica.

Derivatio nominis. The generic name derives from the Caribbean distribution and mirrors the close relation to the *Diapheromera* group.

*Caribbiopheromera jamaicana* sp. n.

Figs 48-49, 96-97, 132-133

Material examined. *Caribbiopheromera jamaicana* n. sp.: HT ♂, Jamaica, PSG-culture, origin: Jamaica. Culture O. Zompro VII.1995 [MHNG, ex coll. O. Zompro 118-2\*];

PT: 1 ♀, 2 eggs [MHNG, ex coll. O. Zompro 118-5\*]; 2 ♂♂, 3 ♀♀, several eggs: as HT [OZ 118-1, 3-4, 6-7\*]; 1 ♀, Zucht U. Ziegler [OZ 118-8\*]; 1 ♂, 3 ♀♀ [Coll. F. Hennemann 61-1-4\*].

## Description.

♂. General colour brown with pale intersegmental membranes. Head subglobose, flat dorsally, a little bit longer than wide, narrowed proximally, ground colour lighter brown, genae with a furrow dorsally, and a wide brown stripe ventrally. Vertex with a wide brown stripe dorsomedially. Frons projecting before antennae with a longitudinal, dark stripe, with several small tubercles lateroposteriorly. Eyes projecting more than hemispherically. Scapus flat and wide, longer than eye, pedicellus less than half as long, subcylindrical, following segments elongated, bristled, in the distal third becoming shorter, last segments whitish before apex. Antennae reaching the end of abdomen.

Pronotum longer than head, rectangular, parallel-sided, anterior part with longitudinal impressions laterally and a median furrow, area around this furrow being darker. Middle of pronotum with a deep, v-shaped, transverse furrow, posterior part with an indistinct median carina, anterior margin of this segment half as broad as posterior one. Mesonotum elongated, as wide as pronotum, smooth, finely marginated laterally. Metanotum of same width and structure, but only one-third as long. Profemora curved basally, subquadrate in cross section, carinae with very fine bristles, tibiae of same structure, one-sixth longer. Basitarsus nearly 2 times as long as following segments combined. Meso- and metafemora quadrate in cross section, basitarsus of mesofemora as long, of metafemora twice as long as remaining segments combined.

Median segment almost by one-third shorter than metanotum. Abdominal segments II to VI structured like thorax, with a yellow spot at anterior angles, a light transverse stripe posteriorly and with indistinct differences in length. Segment VII two-thirds of VI, flattened dorsoventrally. Anterior part of VIII round in cross section, posterior part widened, fused with IX, posterior part of IX subcylindrical, building a closed tube, with its ventral part curved downward. Segment X short, not marginated, with a v-shaped incision. Sternite IX globose, subgenital plate short, angular, with short projection ventrally, a long phallus visible.

Measurements (mm). Body: 46.2-50.8; head: 2.0-2.3; pronotum: 2.1-2.4; mesonotum: 9.6-11.2; metanotum: 3.8-4.7; median segment: 3.0-3.6; profemora: 17.1-18.9; mesofemora: 12.8-13.3; metafemora: 15.9-17.6.

♀. General colour yellow-brown, surface rough, with some tubercles.

Head subglobose, indistinctly longer than wide, vertex and occiput slightly elevated, with several irregular tubercles. Eyes projecting more than hemispherically. Scapus flattened, rectangular, pedicellus globose, one-third as long as previous segment. Antennae reaching the middle of abdominal segment VI, colouration as in ♂.

Anterior half of pronotum with an impression laterally, median transverse impression less distinct. Tubercles prominent, separated. Mesonotum elongated, gently



widened proximally, in anterior third with two or more, prominent, black tubercles. Smaller ones over entire segment; with irregular rows of small, colourless spines laterally. Metanotum with neither spines nor tubercles in dorsal part. Profemora with a strong notch basally, keeled dorsally and ventrally, with two lower keels interiorly, tibiae of same structure, by about one-sixth longer, basitarsus 1.5 times as long as following segments combined, with a median carina, segment II 2 times as long as III and 4 times as long as IV. Mesofemora trapezoid in cross section, narrower dorsally than ventrally, ventral edges in proximal third with a small lobule both interiorly and exteriorly, in distal third with a larger, tooth-like lobule both interiorly and exteriorly as well. Basitarsus as long as following segments, without carina dorsally, but gently furrowed. Hindlegs structured like midlegs, but without lobes, basitarsus by one-third longer than the following segment.

Abdominal segments II to VI of similar length, margined, II to V tuberculated irregularly, VI elevated dorsally, this elevated area supporting stronger tubercles. Segment VII shorter, narrowed distally, with a median carina, segments VIII to X narrower, of equal width; IX shorter than VIII and X, these of equal length, segment IX half as long as VII, carina less sharp as in VIII. Apex of X with a small incision, therefore w-shaped. Subgenital plate broad, projecting beyond the middle of tergite X, margined laterally.

Measurements (mm). Body: 71.2-79.4; head: 3.8-4.3; pronotum: 3.3-4.1; mesonotum: 16.3-18.4; metanotum: 5.9-6.2; median segment: 4.3-4.9; profemora: 22.0-24.8; mesofemora: 14.8-16.2; metafemora: 18.9-21.0.

Egg. Capsule medium to dark brown, smooth, shiny, oval, depressed laterally, anterior and dorsal parts lighter, micropylar plate with a white margin, elongated, anterior margin round, posterior one with micropylar cup acute. An indistinct median line present. Capitulum orange, with lateral margins closed, anterior part torn.

Measurements (mm). Total: 2.95; length: 2.54; width: 1.65; height: 2.00.

Derivatio nominis: From the origin Jamaica.

Comments. This species is in culture in the Phasmid Study Group (PSG No. 17) as "Warty stick" and feeds on bramble. Further information is provided by James (1982: 7).

### *Sermyle* group

Genera. *Litosermyle* Hebard, 1919; *Pseudosermyle* Caudell, 1903; *Sermyle* Stål, 1875 = *Hoplolibethra* Caudell, 1904.

Characteristics. This group seems to be monophyletic because of such common characters as the femora, which are unarmed ventrally, the last abdominal segment (X) of the ♂, which is closed by sternite X ventrally; the latter is not produced as a vomer. The ♂ cerci show a large variety. The body of the ♀ always bears longitudinal carinae. The egg's anterior region around the micropylar plate projecting. Eggs are glued to a surface and not dropped, as in all other groups of Diapheromerini. *Litosermyle* and *Sermyle* differ from *Pseudosermyle* by their broadened mesofemora.

**Key to the genera of the *Sermyle* group:**

♂ ♂:

- 1 Head smooth, not armed. . . . . *Pseudosermyle*  
 - Head armed, at least with two small spines between eyes. . . . . *Sermyle*

♀ ♀:

- 1 Head without spines . . . . . 2  
 - Head armed, mesofemora broadened. . . . . *Sermyle*  
 2 Abdominal segments VIII to X considerably narrower than previous  
 segments. . . . . *Pseudosermyle*  
 - Abdominal segments VIII to X not considerably narrower than previous  
 segments. . . . . *Litosermyle*

Eggs:

- 1 Micropylar plate round, less than one-quarter as high as capsule *Pseudosermyle*  
 - Micropylar plate oval, about half as high as capsule. . . . . *Sermyle*

***Pseudosermyle* Caudell, 1903**

Figs 50-53, 98-99

*Pseudosermyle* Caudell, 1903: 867; Kirby, 1904: 345;*Bacunculus* Brunner v. W., 1907: 331 (nec Burmeister, 1838);*Heteronemia* Rehn, 1904a: 53 (nec Gray, 1835).Type-species. *Pseudosermyle banksii* Caudell, 1903, by original designation.

Material examined and species included. *Sermyle arbuscula* Rehn, 1902: 141: HT ♀, San Diego, California [ANSP\*]; *Bacteria azteca* Saussure, 1859: 62: HT ♀ [MHNG, not traced]; *Pseudosermyle banksii* Caudell, 1903: 871: HT ♂, Brazos County, Texas, September, Mr. Nathan Banks [USNM\*]; *Bacunculus elongatus* Brunner v. W., 1907: 335: ST ♂ ♀, Tepic, Mexico, X.1891, Eisen [NHMW\*]; *Bacunculus godmani* Brunner v. W., 1907: 334: ST ♂, Mexico, Amula, Guerrero, 6,000 ft, VIII., leg. H. H. Smith (676) [NHMW\*]; *Sermyle guatemalae* Rehn, 1902: 7: HT ♀, Gualan, Guatemala. Mrs. S. P. McElroy [USNM\*]; *Bacunculus incongruens* Brunner v. W., 1907: 336: ST 2 ♂, Guatemala, Teapa, Tabasco, leg. H. H. Smith [NHMW\*]; *Bacunculus inconspicuus* Brunner v. W., 1907: 334: ST ♂, Costa Rica, leg. Boucard [NHMW\*], ST 2 ♂, Costa Rica, Amer. Centr., P. Biolley. [MHNG\*]; *Bacteria olmeca* Saussure, 1870: 156: HT ♂, Mexique [MHNG\*]; *Sermyle phalangiphora* Rehn, 1907: 229: HT ♂, Belize, British Honduras [ANSP\*]; *Sermyle physconia* Rehn, 1914: 51: HT ♂, PT ♀, Piedras Negras, Costa Rica (Schild nd Burgdorf) [USNM\*]; *Bacunculus praetermissus* Brunner v. W., 1907: 333: LT (here designated) ♂, Coll. Br. v. W., Guatemala, Dr. Candeze; det. Br. v. W., *Bacunculus praetermissus*: 7307: 22., 7307. [NHMW\*]; *Bacunculus stramineus* Scudder, 1904: 20: ST ♂ ♀, Between Mesilla Park and Little Mountain, July 1 (A. P. Morse) [ANSP\*]; *Bacunculus striatus* Burmeister, 1838: 567: ST ♂ ♀, Mexico, Deppe [ZMHB\*]; *Sermyle strigata* Scudder, 1899: 34, pl. 1: 3: HT ♀, Texas, Boll., Lincecum [ANSP\*]; *Diapheromera strigiceps* Kaup, 1871b: 27: HT ♂, Puebla, Becker [HLDH\*]; *Bacunculus tridens* Burmeister, 1938: 567: HT ♂, Mexico, Oaxaca [ZMHB]; ♂ ♀, 1 egg ex abdomen: Mexico, Cuervavaca [ZMUH\*]; *Pseudosermyle truncata* Caudell, 1903: 869, pl. 58: 3a-b: HT ♀, Dos Cabezas, Arizona, June, 1891, No. 6613. [USNM]; *Pseudosermyle* sp. ("*Heteronemia mexicana*") Brunner v. W., 1907: 333, nec Gray, 1835: 19: ♂: Coll. Brunner v. W., Mexico, Deyrolle [NHMW\*].

Complementary description. ♂ ♀. ♂ very slender, ♀ comparatively compact; medium to large sized members of this group. Head elongated, almost twice as long (♂) or 1.5 times as long as wide, flattened dorsally. Scapus flattened, almost rectangular, pedicellus half of its length and two-thirds of its width. Antennae reaching

abdominal segment VIII (♂) or III (♀). Prothorax shorter (♂) or of equal length (♀) as head. Mesonotum of same width (♂) or wider (♀) than pronotum, strongly elongated. Body smooth, a little bit shiny (♂) or with several longitudinal carinae and not shiny (♀). Metathorax longer than two-thirds of mesothorax, with equal structure. Legs slender, long. Profemora curved basally, triangular in cross section, in / with lobe-like keels on each edge. Protibia considerably longer, probasitarsus longer than combined length of following segments. Meso- and metafemora unarmed, trapezoid in cross section. Mesobasitarsus shorter, metabasitarsus as long as following segments combined. Median segment shorter than one-fifth of metanotum and one-third as long as abdominal segment II. III to VI (♂) or III to V (♀) of similar length, longer than II. Segments in ♂ parallel sided, in ♀ IV widest. VII as long as II. VIII of ♂ bell-like widened caudadly, IX much narrower, X broadened again. VIII as long as IX and X combined, the latter of equal length. VIII to X separated indistinctly, without magnification appearing fused. IX and X closed by sternite IX and X ventrally, forming a closed tube. Subgenital plate small, almost closed dorsally, at least in the anterior part. Cerci of ♂ show large variety: simple, bi- or trid or spatuliform. Segments VIII to X of ♀ considerably narrower than the previous ones, parallel-sided. VIII and IX of equal length, X 1.5 times as long as IX. Subgenital plate small, triangular, with median keel. Cerci straight, wide projecting, apices with variable morphology. Subgenital plate very specific, acute, projecting IX slightly.

Egg. Capsule elongated, almost round in transverse section. Micropylar plate round, small, less than one quarter of length of capsule. Operculum round, inserted in an angle of about 45°; capitulum absent. The egg is glued to a substrate ventrally.

Distribution. Southern USA, Middle America.

Comments on the genus. The type of *P. banksii* could not be examined, but Kaup's *D. strigiceps* agrees with Caudell's diagnosis, so it might be a synonym of the latter, but this needs confirmation. They definitely belong to the same genus.

The designation of *Sermyle arbuscula* Rehn, 1902, as type-species by Kirby (1904: 345) was based on a misprint and corrected by himself (1910: 359).

Caudell's diagnosis versus the related genera shows sheer carelessness. "The most stable character" which divides this genus from *Bacunculus* Burmeister, the latter being synonymized with *Heteronemia* Gray, 1835, by Zompro (in press) is the presence of an area apicalis in the latter, which places it in the suborder Areolatae and makes it impossible to be closely related to *Pseudosermyle*. This was the reason why later authors synonymized these genera (Rehn, 1904: 53) (see notes on *Heteronemia* in Zompro, in press). Without doubt, however, *Pseudosermyle* is a valid genus, but Caudell did not recognize its important characteristics. The morphology of the cerci with one to three apices or being totally flattened is only of importance at the specific level. Often this is the only character to separate the ♂♂ of various species.

Brunner's *Bacunculus* (1907) and Rehn's *Heteronemia* (1904) are synonyms of *Pseudosermyle* Caudell, as their genera are based on an misidentification of the type-species. For further comments see Zompro (in press).

The diagnosis below has been complemented by a ♂, a ♀, and an egg taken out of the ♀ abdomen of *Pseudosermyle tridens* (Burmeister, 1838).



*Litosemyle* Hebard, 1919

Fig. 54

*Litosemyle* Hebard 1919: 171.Type-species. *Litosemyle ocanae* Hebard, 1919, by original designation.Material examined and species included. *Litosemyle ocanae* Hebard 1919: 172, pl. 23: 9, 10: HT ♀, Puebla Nueva de Ocaña, Santander, Colombia [ANSP\*].

Complementary description. ♀. Head considerably longer than wide, with several small tubercles, longer than prothorax. Scapus dilating anteriorly, pedicellus half as long and two-thirds as wide, antennae reaching abdominal segment III. Body with longitudinal carinae. Mesothorax more than 4 times as long as prothorax and about twice as long as metathorax, tuberculated. Profemora curved basally, strongly laminate. Mesofemora slightly broadened, metafemora slender. Tibiae longer than femora. Basitarsi slightly longer than combined length of following three segments. Abdominal segment II twice as long as median segment, III to VI of similar length, each longer than II, VII shorter than VI. Segments VIII to X of equal width, not narrower than VII, IX shorter than VIII, VIII shorter than X. Subgenital plate not projecting middle of X.

Male and egg unknown.

Distribution. Colombia.

Comments on the genus. In his diagnosis, Hebard did not count the median segment as part of the abdomen. The species has never been recorded again, while the type, which has only been re-examined from a picture, is damaged. For further comments see *Sermyle*.

*Sermyle* Stål, 1875

Figs 55-58, 100-101

*Sermyle* Stål, 1875: 23; Rehn, 1904: 51; Kirby, 1904: 345; *Hoplobibethra* Caudell, 1904: 108; *Libethra*: Brunner v. W., 1907: 303 (part.); *Ocnophila*: Brunner v. W., 1907: 309 (part.); *Bacunculus*: Brunner v. W., 1907: 331 (part.).

Type-species. *Acanthoderus mexicanus* Saussure, 1859, by subsequent designation of Rehn, 1904: 51.

Material examined and species included. *Diapheromera bidens* Kaup, 1871b: 28: HT ♂, Puebla, Becker [HLDH\*]; *Libethra confusa* Brunner v. W., 1907: 308: ST ♀, Guatemala, Dr. Candeza [NHMW]; *Sermyle kujawskii* Zompro 1998: 212: HT ♂, PT ♀, several eggs, Honduras, Isl. Utila, III.1997, leg. T. Kujawski [OZ\*]; *Acanthoderus mexicanus* Saussure, 1859: 62: HT ♀, Mexico, Potsero [MHNG\*]; ♀, coll. Brunner v. W., Mexico [NHMW\*]; *Bacunculus neptunus* Brunner v. W., 1907: 335: HT ♂, Mexico, California, 95. Digue [NHMW\*]; *Sermyle kirbyi* n. n. for *Diapheromera saussurei* Kirby, 1889: 501: HT ♂, Dominica, St. Michael [BMNH\*]; *Sermyle saussurii* Stål, 1875: 77: HT ♀, Mexico [NHMW\*]; *Hoplobibethra tuberculata* Caudell, 1904: 108, pl. 6: 1, 2: HT ♀, Esperanza Ranch, June 25 [USNM\*].

Complementary description. ♂ ♀. Body of ♂ smooth, of ♀ rough, granulated. Head globose, vertex elevated, armed with spines or lobes, eyes projecting hemispherical, slightly longer than wide. Scapus flattened rectangular, pedicellus two-thirds as wide as scapus and half as long. Prothorax as long and wide as head. Mesothorax elongated, as wide as prothorax (♂) or equally dilating (♀); metathorax two-thirds of its length, with equal structure. Profemora slender, triangular in cross section, with one dorsal, two interior and one ventral carina. Probasitarsus as long as following four segments without unguis. Meso- and metafemora trapezoid in cross section. Meso-



femora slightly (♂) or strongly broadened and with dorsoventral lobes (♀). Mesobasitarsus as long as following three segments together. Metafemora slender, metabasitarsus as long as following segments together, unguis excluded. Median segment less than one-quarter (♂) or one-third (♀) as long as metathorax. Abdominal segment II twice as long as median segment, III almost as long as IV to V (♂) or IV to VI (♀). VI of ♂ as long as II, VII shorter. VIII parallel sided, slightly shorter than VII, as long as IX. X little longer, emarginated posteriorly, closed by sternite X ventrally. Subgenital plate small. Cerci specialized, variable. VI of ♀ in the type-species with dorsolateral lobes, VII slightly shorter than II, VIII shorter than VII, as long as X, IX shorter. VIII to X of equal width, considerably narrower than VII. Cerci short, simple, straight. Subgenital plate short, acute, simple, not projecting beyond IX.

Egg. Capsule rounded subrectangular, with punctured structure, covered with bristles. The egg is glued to a substrate laterally. Micropylar plate projecting anteriorly. Operculum round, flat, surrounded by bristles, inserted in the capsule in an angle of about 20°.

Distribution. Southern USA, Middle America.

Comments on the genus. According to Hebard (1932: 216), *Hoplibethra tuberculata* Caudell, the type-species of *Hoplibethra* Caudell by original designation, is identical with *Acanthoderus mexicanus* Saussure, the type-species of *Sermyle* Stål. This is not correct, *H. tuberculata* is a valid species, but obviously a member of *Sermyle*. Consequently *Hoplibethra* Caudell falls in synonymy. Caudell, who only saw a single specimen, mentions the different lengths of the abdominal segments. A comparison between his type and *S. mexicana* shows no significant differences, so *S. tuberculata* is a typical member of *Sermyle*.

The type of *Diapheromera bidens* Kaup has also been re-examined. It agrees in the main characters with the ♀ of the type-species and might be the ♂; it was used for completing the diagnosis of the genus. *Sermyle kujawskii* agrees in the main characters, but has a flat and unarmed head. The ♂ has styli, this being the first such case known in Phasmatodea. The terminal three segments of the ♀ are not narrowed. It might be a different genus, but no formal consequences can be drawn until definite ♂♂ of *S. mexicana* are known.

The description of the egg is based on *S. kujawskii*, which might not be a typical member of this genus. It is possible that the genus has to be split; but this should be done in a revision at the species level. Possibly the species with a flat head belong to *Litosermyle*, but an examination of its type and all species with this character is required. The broadened mesofemora of the ♀ show relationship to *Litosermyle*.

### *Clonistria* group

Genera. *Clonistria* Stål, 1875; *Libethra* Stål, 1875; *Libethroidea* Hebard, 1932; *Rugosolibethra* n. n. (= *Caulonia* Stål, 1875, nec Lorient, 1873); *Oncotophasma* Rehn, 1904; *Paraclonistria* Langlois & Lelong, 1998; *Phantasca* Redtenbacher, 1906; *Pseudocerocys* Hebard, 1923; *Pterolibethra* Günther, 1940; *Spinopeplus* gen. n.; *Trychopeplus* Shelford, 1909.

**Characteristics.** The *Clonistria* group consists of monophyletic genera with common characters, but it seems to be in the process of diverging. The genera *Clonistria* and *Phantasca* show similarity with Libethroidea, as all are slender phasmids without striking metamorphosis of the body. The ♂♂ of *Libethroidea* have small, lateral nodes on their terminal tergite, as they are present in *Libethra*, *Pterolibethra*, *Rugosolibethra* and *Spinopeplus*, too. The ♀♀ of the latter show relation to *Oncotophasma* by their genitalic structures and the operculum of the egg which, in both genera compared, is covered by hairy structures. Throughout the group, apterous genera have a winged counterpart. The most striking member is *Trychopeplus*, a very specialized genus with a number of appendages on the body; its genitalia show close relation to *Oncotophasma*.

The presence of a capitulum in *Paraclonistria* is unique in the *Clonistria* group. No material of the type-species could be examined, and it is possible that its capitulum is just a pseudocapitulum.

Antennae longer than body (♂) or at least reaching abdominal segment V, profemora unarmed, non-serrated, three-edged, meso- and metafemora trapezoid, pro- and metabasitarsi longer than, and mesobasitarsi as long as, following segments combined, tarsal segments sulcate dorsally, at best slightly carinated, then carina sulcate dorsally, ♂ with vomer, ♀ with praeopercular organ, body surface of ♂ smooth, of ♀ often rough or granulated. Eggs bullet-like, capitulum absent (Exception: *Paraclonistria*).

### Key to the genera of the *Clonistria* group

♂♂:

- |    |  |                       |
|----|--|-----------------------|
| 1  | Tergite X with lateral nodes. . . . .  | 2                     |
| -  | Tergite X without lateral nodes. . . . .                                       | 6                     |
| 2  | Tergites VIII and IX of equal width, parallel sided. . . . .                   | <i>Libethroidea</i>   |
| -  | Tergite IX at least somewhat little narrower than VIII. . . . .                | 4                     |
| 3  | Tegmina and alae present. . . . .  | <i>Pterolibethra</i>  |
| -  | Tegmina and alae absent. . . . .   | 5                     |
| 5  | Elongated species, mesonotum more than 20 times as long as wide. . . . .       | <i>Libethra</i>       |
| -  | More compact, mesonotum less than 12 times as long as wide. . . . .            | <i>Rugosolibethra</i> |
| 6  | Anterior half of metanotum with same structure as posterior part. . . . .      | 7                     |
| -  | Anterior half of metanotum with different structure as posterior part. . . . . | <i>Oncotophasma</i>   |
| 7  | Body and extremities without spines or leaf-like appendices. . . . .           | 9                     |
| -  | Body and extremities with spines or leaf-like appendices. . . . .              | 8                     |
| 8  | Extremities and body with simple spines. . . . .                               | <i>Spinopeplus</i>    |
| -  | Extremities and body with leaf-like appendices and lobes, winged. . . . .      | <i>Trychopeplus</i>   |
| 9  | Tegmina and alae present. . . . .  | <i>Phantasca</i>      |
| -  | Tegmina and alae absent. . . . .   | 10                    |
| 10 | Head as long as pronotum, not longer. . . . .                                  | <i>Clonistria</i>     |
| -  | Head longer than pronotum. . . . .   | <i>Paraclonistria</i> |

- ♀ ♀:
- 1 Supra-anal- and subgenital plate elongated. . . . . *Pseudoceroys*
  - Supra-anal plate not elongated. . . . . 2
  - 2 Subgenital plate not projecting tip of abdomen. . . . . 5
  - Subgenital plate projecting tip of abdomen. . . . . 3
  - 3 Extremities and body without spines or leaf-like appendices and lobes  
. . . . . *Oncotophasma*
  - Extremities and body with spines or leaf-like appendices and lobes. . . . . 4
  - 4 Extremities and body with simple spines. . . . . *Spinopeplus*
  - Extremities and body with leaf-like appendices and lobes. . . . . *Trychopeplus*
  - 5 Supra-anal plate elongated, projecting beyond tip of abdomen. . . . . *Libethroidea*
  - Supra-anal plate neither elongated nor projecting beyond tip of abdomen. . . . 6
  - 6 Abdominal segments II to VII of similar length. . . . . 7
  - Abdominal segments IV to VI of similar length, longer than the remaining. . . 8
  - 7 Extremities armed, at least undulate dorsally. . . . . *Rugosolibethra*
  - Extremities unarmed. . . . . *Libethra*
  - 8 Head as long as pronotum, not longer. . . . . *Clonistria*
  - Head longer than pronotum. . . . . *Paraclonistria*

## Eggs:

- 1 Capitulum present. . . . . *Paraclonistria*
- Capitulum absent. . . . . 2
- 2 Operculum inserted in capsule with angle of 90°. . . . . *Clonistria*
- Operculum inserted in capsule with angle of less than 80°. . . . . 2
- 3 Operculum inserted in capsule with angle of ca. 70°. . . . . 4
- Operculum inserted in capsule with angle of 45°, capsule punctured *Spinopeplus*
- 4 Capsule with net-like structure. . . . . *Oncotophasma*
- Capsule covered with short, not combined keels. . . . . *Libethra*

***Paraclonistria*** Lelong & Langlois, 1998

***Paraclonistria*** Lelong & Langlois, 1998: 250

Type-species. *Paraclonistria nigramala* Lelong & Langlois, 1998, by original designation.

Species included. *Paraclonistria nigramala* Lelong & Langlois, 1998: 250, figs. 16-21, 28-30.

Diagnosis. See Lelong & Langlois, 1998.

Distribution. Caribbean Islands.

Comments on the genus. The occurrence of a capitulum in this genus is unusual for it is the only member with this character in the *Clonistria* group. Nonetheless, this genus shows close relationship with *Clonistria* Stål. Another, yet undescribed member of this genus is reared in the Phasmid Study Group as "Tony James St. Kitts", which displays the same characters in the morphology of the adults and the egg, except for the capitulum being absent. The operculum of this species is roughly structured. The presence of a capitulum could prove relations to the previous group.

*Clonistria* Stål, 1875

Figs 30-31, 102-103

*Clonistria* Stål, 1875: 6; 1875: 25; Rehn, 1904: 60; Redtenbacher, 1908: 403; Shelford, 1909: 358.

Type-species. *Clonistria bartholomaea* Stål, 1875: 16, by monotypy.

Material examined and species included. *Clonistria bartholomaea* Stål, 1875: 16: ST 2 ♂♂, Insula Santi Bartholomaei Indiae occidentalis [NHRS\*]; ♂♀, Balthazar, (Windward side), Grenada, W. L., H. H. Smith, coll. Brunner v. W. [NHMW\*]; 8 ♂♂, 5 ♀♀, several eggs, Ex culture O. Zompro, origin: Grenada [OZ\*]; *Clonistria exornata* Redtenbacher, 1908: 405: ST 2 ♂♂, 2 ♀♀, Cuba, Mr. H. d. Saussure [MHNG\*]; *Clonistria guadeloupensis* Redtenbacher, 1908: 404: ST ♂, Guadeloupe, Steinheil [NHMW\*]; ST 2 ♂♂, 3 nymphs [SMNS\*]; ST 2 ♀♀ [MHNG\*]; *Bacteria haita* Westwood, 1859: 25, pl. 25: 5, 6 [BMNH]; *Clonistria santalucia* Redtenbacher, 1908: 405: HT ♀, St. Lucia, Mus. Paris [NHMW\*]; *Clonistria xenia* Redtenbacher, 1908: 405: ST ♂♀, locality not known [NHMW\*].

Complementary description. ♂♀. *Clonistria*-species are characterized by their unarmed body, the equally length of meso- and metanotum, the rough surface of the body of the ♀, the elongated, flattened head and the unarmed femora. The different species are difficult to determine, the lateral appendices of the ♂ vomer and the morphology of the eggs are helpful.

Medium-sized, slender members of this group of Diapheromerinae. ♀ longer than ♂, body of both sexes without spines or larger tubercles, abdomen longer than thorax. Thorax and abdomen of ♀ with fine median keel, sternite VII with praeopercular organ. Head rectangular, longer than wide, narrowed proximally, flattened, scapus flat, longer than wide, pedicellus half as long and much narrower, cylindrical, antennae surpassing apex of abdomen (♂) or reaching proximal part of abdominal segment IV (♀). Prothorax as long as head, of equal width, mesonotum elongated, more than 2 times as long as metanotum. Profemora curved basally, three-edged, tibiae longer, basitarsus 2 (♂) or 1.5 (♀) times as long as following tarsal segments combined. Meso- and metafemora four-edged, unarmed, only with one or more indistinct teeth ventroapically, tibiae longer than femora, mesobasitarsus 1.5 times longer (♂) or of equal length (♀), metabasitarsus 2 times (♂) or almost 1.5 times (♀) as long as following tarsal segments combined. Median segment almost as long as metanotum, of equal length as abdominal segment II. Abdomen of ♂ parallel, of ♀ widened in the median segments. Relations of length of segments equal in both sexes. Segment III longer than II, IV to VI of same length, longer than III. VII as long as III, VIII to X (♂) or VIII and X of equal length, longer than IX (♀). VIII to X of ♂ almost parallel-sided, X only indistinctly wider than IX, posterior margin with v-shaped outcut. ♀ with prominent supra-anal plate, with median carina. Subgenital plate small, comparably flat, with concave posterior margin (♂) or reaching or surpassing apex of abdomen, acute (♀). ♂ with long triangular vomer with lateral appendices. Cerci short.

Egg. Bullet-like, grey, with keel-like structures, micropylar plate oval, half as long as capsule, with short median line. Operculum flat, inserted in an angle of 90° to the capsule, with keel-like structures as on the capsule.

Distribution. Caribbean Islands.

Comments. Bradley & Galil (1977) place *Clonistria* in the Cladomorphinae: Hesperophasmatini. (Cladomorphinae is used by Bradley & Galil, 1977: 189). Yet in



their key *Clonistria* does not lead to this tribe, and is a typical member of Diapheromerinae.

***Phantasca* Redtenbacher, 1906**

Fig. 32

*Phantasca* Redtenbacher, 1906: 111.

Type-species. *Phasma phantasma* Westwood, 1859: 126, pl. 12: 5a, b, by present designation.

Species included. *Phasma phantasma* Westwood, 1859: 126, pl. 12: 5a, b: HT ♂, Tapajos, Brazil, Bates; *Phasma puppeius* Westwood, 1859: 125, pl. 10: 1: HT ♂, Brazil, Tapajos, Bates; *Phasma valgius* Westwood, 1859: 126, pl. 10: 3: HT ♂, no data.

Origin. Brazil.

Complementary description. ♂. Very similar to *Clonistria* Stål. Head slightly globose, not armed. Eyes projecting hemispherically. Prothorax as long as head, slightly narrowed posteriorly. Mesothorax elongated, almost 7.5 times as long as prothorax. Metathorax half as long as mesothorax and 3 times as long as median segment. Tegmina squamiform, alae produced, reaching end of abdominal segment V. All femora and tibiae not armed. Profemora curved basally. Pro- meso- and metabasitarsi longer than following segments combined. Abdominal segments of same width, II less than 2 times as long as median segment, III longer than II, IV longest segment, V slightly longer than II, VI as long as II, VII half as long as V. VIII two thirds as long as VII, X slightly shorter than VIII, IX longer than VIII and shorter than VII. X margined posteriorly. Subgenital plate triangular in lateral view, not projecting IX.

Both ♀ and egg unknown.

Distribution. Brazil.

Comments. Redtenbacher placed this genus erroneously in the Areolatae. Günther (1940: 500) is in error about *Phantasca* Redtenbacher being synonymous with *Pterolibethra* Günther, 1940, as the genitalia of the first resemble *Clonistria* Stål and those of the latter *Libethra* Stål, 1875.

***Libethroidea* Hebard, 1919**

Figs 33-35

*Libethroidea* Hebard, 1919: 170.

Type-species. *Libethroidea inusitata* Hebard, 1919: 170, pl. 23: 7, 8, by original designation.

Material examined and species included. *Libethroidea inusitata* Hebard, 1919: 170, pl. 23: 7, 8: HT ♀, Atlas de las Cruces, near San Antonio, Cauca, Colombia. Elevation, 7200 feet. October, 1908. [USNM\*]; *Bacunculus* (?) *nodosus* (Giglio-Tos, 1898: 27: HT ♂, Gualaquiza. [MIZT\*], *Bacunculus palea* Giglio-Tos, 1898: 26: HT ♀, Valle del Santiago. [MIZT\*]; *Bacunculus sarmentum* Giglio-Tos, 1898: 25: HT ♀, Valle de Santiago. [MIZT\*].

Complementary description. ♂ ♀. Medium sized members of this group. Head flat, unarmed, smooth, as long or little longer than prothorax, of same width. Eyes projecting hemispherically. Scapus flattened, twice as long as the cylindrical pedicellus, antennae projecting beyond apex of abdomen (♂) or reaching anterior half of abdominal segment VII. Mesonotum very slender, little less than twice as long as meta-

notum and much narrower than prothorax (♂) or little longer than 1.5 times the length of metanotum, of equal width as prothorax (♀). Profemora three-edged, tibiae longer, probasitarsus longer (♂) or as long as (♀) following segments combined. Meso- and metafemora four-edged, unarmed, tibiae longer, mesobasitarsus as long as, metabasitarsus longer than (♂) or as long as length of following segments combined. All tarsal segments slightly furrowed. Median segment short, less than one-fifth of metanotum, abdominal segment II more than twice as long as median segment, segments III to VI of same length, in ♂ of same width, in ♀ wider than the other segments, VII little shorter. Tergites II to VII of ♀ with several parallel longitudinal carinae. VIII of ♂ fewly shorter than IX, of same width, X fewly longer than VIII, with lateral node-like structures. Lateral margins of IX turned downward, posterolateral corners not touching each other ventrally. Subgenital plate small, not covering internal organs totally. Vomer small, flat, simple. VIII of ♀ twice as long as IX, IX very elongated, acute, with dorso-median carina, projecting apex of abdomen by the length of VIII. X as long as length of VIII and IX combined. Subgenital plate projecting IX by the half of its length, posterior margin with v-shaped incision.

Egg. Unknown.

Distribution. Northern half of South America.

Comments on the genus. Hebard (1919) does not count the median segment as first abdominal segment, this has to be considered when using his diagnosis. The morphology of the ♀ genitalia is very characteristic and similar to that of *Parocnophila* Zompro, a member of Ocnophilini.

### *Libethra* Stål, 1875

Figs 36-37, 104-105

*Libethra* Stål, 1875: 20; Kirby, 1904b: 345; Hebard, 1919: 163; Brunner v. W., 1907: 303; Shelford, 1909: 344; *Ocnophila*: Brunner v. W., 1907: 313 (part.).

Type-species. *Libethra nisseri* Stål, 1875: 74, by subsequent designation of Kirby, 1904: 345.

Material examined and species included. *Bacteria molita* Westwood, 1859: 29, pl. 24: 3; HT ♂, Columbia, Goudot. [OXUM\*]; *Libethra nisseri* Stål, 1875: 74: LT (by present selection) ♂, Columbia, Antioquia, leg. Nieder (Body length: 65 mm). PLT ♀: same data [NHRS\*]; 7 ♂ ♂, 6 ♀ ♀, 5 eggs, Colombia, Aruenia, on *Pinus patula* Schldl. & Cham., 18°C. 1800m. IV.1994, leg. C. Rodas [SMTD\*, OZ\*]; *Ocnophila zamorana* Giglio-Tos, 1910: 29: HT ♀, Valle dello Zamorana nell'Ecuador. [MIZT\*].

Complementary description. ♂ ♀. Medium to large sized members of this group. Body smooth, unarmed, slender, elongated. General colour of ♂ brown, ♀ yellow or brown. Head flat, unarmed, little longer than wide, subparallel-sided. Eyes projecting hemispherically. Scapus flat, considerably longer than wide, pedicellus little longer than half of its length, antennae reaching beyond abdominal segment VI (♂) or at least III (♀). Prothorax as long and wide as head, mesothorax elongated, more than 15 times (♂) or more than 7 times (♀) as long as wide, parallel-sided (♂) or slightly widened proximadly (♀). Mesothorax almost 2 times as long as metathorax. Profemora basally curved, three-edged, unarmed, tibiae longer, probasitarsus as long as following segments combined. Meso- and metafemora four-edged, unarmed, except for some very

small spines ventroapically, tibiae little longer, mesobasitarsus as long as following three, metabasitarsus as long as the following segments combined. All tarsal segments furrowed dorsally, the furrow sometimes indistinct. Thorax and abdomen of ♀ with indistinct median carina. Metathorax more than 6 (♂) or more than 4 times (♀) as long as median segment. Abdominal segment II twice as long as median segment, as long as VII, shorter than III, III to IV of equal length and width (♂), or IV to VI of equal length and width, the widest segments (♀). VIII of ♂ as long as X, swollen, with prominent median carina, IX longer, X with two lateral node-like structures, subgenital plate not reaching posterior end of tergite IX, variable. Lateral margins of IX turned ventrad, posterolateral edges almost touching ventrally. VIII of ♀ as long as IX and X combined, IX considerably longer than X, posterior margin of X concave, subgenital plate not projecting apex abdominis, with v-shaped outcut. Cerci of ♂ strong, curved, with specific forms in different species, simple in the ♀. Short and flat vomer present, ♀ with praeopercular organ.

Egg. Bullet-like, capsule covered with rough, bulgy structures, micropylar plate oval, with prominent margin, one-third as long as capsule, prominent median line present, reaching the polar area. Operculum inserted with an angle of 70°, structured as capsule.

Distribution. Northern half of South America.

Comments on the genus. Brunner (1907: 304) selected *Libethra sutoria* Stål 1875: 75 as type of *Libethra*. This selection was antedated by Kirby (1904b: 345) and is therefore invalid. Hebard (1919: 163) stated that *Libethra* Stål, 1875 is a synonym of *Caulonia* Stål, 1875, because the types (*Ceroys rabdota* Westwood, 1859 and *Libethra nisseri* Stål, 1875) should be congeneric. This is obviously not the case.

Günther (1932: 226 ff.) published a review of *Libethra*, mainly based on a collection from Colombia. He divides the genus into the *Libethra rabdota* group and the *Libethra strigiventris* group. His first group agrees with *Caulonia* Stål; it is characterized by lobes on the ♀'s abdominal segment III. These lobes are absent in his second group, which includes provisionally *Libethra nisseri* Stål, and Günther considers that „sie gar nicht in dieses Genus gehört“ (1932: 248), ignoring the fact that it is the type-species. These lobes are variable and therefore not useful as generic character. The armation of the femora does not vary. *Libethra* always has unarmed femora. For further comments see *Rugosolibethra*.

### *Pterolibethra* Günther, 1940

Fig. 38

*Pterolibethra* Günther, 1940: 498.

Type-species. *Pterolibethra heteronemia* Günther, 1940: 499, by original designation.

Material examined and species included. *Pterolibethra heteronemia* Günther, 1940: 499: HT ♂, Rio Negro, San Gabriel, 3.I., Roman leg. (Schwedische Amazonasexped.) [NHRS\*]: *Pterolibethra* sp.: ♂, Bolivia, Guanay, Ujapi, X.1994, leg. L. Peña & A. Ugarte. [OZ 0-123\*].

Complementary description. ♂. Medium to large members of this group. The genus agrees in all aspects with *Libethra*, but differs in the following characters: Head globose, wider and longer than prothorax. Antennae reaching end of abdominal

segment VII. Pro- and metabasitarsi twice as long as following segments combined. Elytra and alae present. Tegmina short, not reaching middle of metanotum, with tubercle mesolaterally. Alae covering abdominal segment III. Median segment two-thirds of length of metanotum.

♀ and egg unknown.

Distribution. Brazil, Bolivia.

Comments on the genus. Günther is in error about the length of the median segment. It is obvious from the colourprint by P. Brock of the type, that the median segment measures only two-thirds of the metanotum. The genitalia show in fact a close relationship to *Libethra*, from which it is separated by the length of the median segment, the form of the head and the wings only. In an appendix (1940: 500) he calls *Pterolibethra* a synonym of *Phantasca* Redtenbacher. This is wrong, because the genitalia of *Phantasca* resemble *Clonistria*, those of *Pterolibethra* are similar to *Libethra*.

### ***Rugosolibethra* n. n.**

Figs 39-40

*Caulonia*: Stål, 1875: 20, 74; Stål, 1875: 10; Kirby, 1904b: 344; Hebard, 1919: 163 (nec Lorient, 1873); *Ceroys*: Westwood, 1859: 59 (part.).

Type-species of *Caulonia* Stål, 1875. *Ceroys rabdota* Westwood, 1859: 61, pl. 22: 6a-e, by subsequent designation of Hebard, 1919: 163.

Material examined and species included. *Libethra crassespinoza* Brunner v. W., 1907: 307: ST ♀, Columbia. [NHMW\*]; *Ocnophila imbellis* Brunner v. W., 1907: 312: HT ♀, ♂. [MCSN\*]; *Ceroys rabdota* Westwood, 1859: 61, pl. 22: 6: HT ♀, Columbia, Gaudichaud. [OXUM\*]; ♂, Coll. Brunner v. W., Sta. Fé de Bogota, Staudinger [NHMW\*]; *Libethra rabdotula* Brunner v. W., 1907: 307: ST ♂ ♀, Bogota. [NHMW\*]; *Libethra ramale* Giglio-Tos, 1898: 27: HT ♀ [MIZT\*].

Diagnosis. ♂ ♀. A typical member of the *Clonistria* group. Terminal segment of ♂ with lateral nodes as *Libethroidea* or *Libethra*, but more compact. The ♀ differs from the closely related genera as shown in the key by their armed meso- and metafemora.

Medium sized members of this group. Body of ♂ smooth, of ♀ granulated, rugose or belobed. Head distinctly longer than wide, depressed and smooth in ♂, slightly elevated and armed in ♀. Scapus flat, broadened anteriorly, pedicellus almost as wide and half as long. Antennae reaching abdominal segment II (♀). Prothorax as long as head, of same width. Mesothorax as wide as (♂) or wider (♀) than prothorax. Metathorax slightly shorter (♂) or longer (♀) than half as long. Profemora curved basally, triangular, meso- and metafemora trapezoid in cross section. Femora and tibiae armed in ♀, in ♂ smooth. Pro- and metabasitarsus about as long as following segments combined, mesobasitarsus slightly shorter. Median segment one fifth (♂) or third (♀) as long as metathorax. Abdominal segments of ♂ elongated, II twice as long as median segment, II to IV increasingly longer, V as long as IV, VI as III, VII as II, dilating posteriorly. VIII slightly shorter than VII, increasingly dilating, turned downwards laterally, with slight median carina. IX as long as IV, turned ventrad laterally, almost touching in its full length ventrally, with dorsomedian carina. X as long as VIII, emarginated posteriorly and produced in two large nodes laterally. Subgenital plate



very prominent, bulbous, anterior part lateral depress. Vomer small, flat. Cerci strong, but short, curved. Abdominal segments of ♀ transverse, II 1.5 times as long as median segment, II to V of similar length and width, III (at least in the type) with dorsal lobes, VI of same length, slightly narrower, VII dilating posteriorly, as long as VI. VIII narrowed posteriorly, longer than VII. IX and X narrower than previous segments, IX slightly shorter than VII, X almost half as long as IX, with a notch posteriorly. Cerci short, small. Subgenital plate reaching tip of abdomen.

Egg. Unknown.

Distribution. Northern half of South America.

Comments on the genus. Kirby (1904: 344) selected *Ceroys biggibus* Rehn 1904: 48 as type-species of *Caulonia* Stål. This species was not included by Stål and is therefore not available. Subsequently Hebard (1919: 163) designated *Ceroys rabdota* Westwood, 1859 as type-species. *Caulonia* Stål is preoccupied by *Caulonia* Loriol 1873, a genus of Echinodermata. Most authors considered *Caulonia* Stål as a synonym of *Libethra*, but there are striking differences between these genera. ♀♀ of *Libethra* do not show appendices on the body like those present in *Rugosolibethra*, femora are not armed, both sexes are much slenderer. Supposedly the egg will show further differences. For further comments see *Libethra*.

### *Spinopeplus* gen. n.

Fig 41-42, 106-107, 134-135

*Caulonia*: Kirby, 1904: 344 (part).

Type-species. *Ocnophila festae* Giglio-Tos, 1910: 28, by present designation.

Origin. Ecuador.

Material examined and species included. *Caulonia conradi* Giglio-Tos, 1898: 30: HT ♀, Pun. [MIZT\*]; *Ocnophila festae* Giglio-Tos, 1910: 28: LT ♀, Valle del Santiago nell'Ecuador [MIZT\*], selected by Brock, 1998a: 301; 1 ♂ ♀, 1 egg ex abdomen: Santa Inez (Ecuad.) R. Haensch S. [OZ 308-1, 2\*]; *Libethra senticosa* Giglio-Tos, 1898: 26: HT ♀, Valle de Santiago nell'Ecuador. [MIZT\*]; *Caulonia spinosissima* Kirby, 1896: 464, pl. 40: 4, 4a (not 5, 5a): Archidona.

Diagnosis. ♂♀. One of the more specialized genera of this group. Closely related to *Rugosolibethra*, as it is obvious from the structure of the ♂ genitalia. That of the ♀ shows relations to *Oncotophasma* and *Trychopeplus*, the transverse abdominal segments are similar to those seen in *Rugosolibethra*. The egg is a further hint for a close relationship.

Average sized members of this group of Diapheromerinae. Both sexes of equal length, thorax and abdomen spinose, abdomen shorter than thorax. Head globose, vertex spinose, eyes projecting hemispherically, scapus flattened, longer than wide, pedicellus quadrate, antennae longer than body (♂) or reaching abdominal segment VIII (♀). Pronotum shorter and narrower than head. Mesothorax of ♂ strongly elongated, parallel-sided, narrower than pronotum, spinose, of ♀ proximadly equally widened. Metathorax structured as mesothorax, about two-thirds of its length. Profemora curved basally, three-edged, armed in the ♀, protibiae considerably longer than femora, basitarsus longer than (♂) or as long as (♀) following segments combined. Meso- and metafemora four-edged, unarmed with at least one small ventroapical spine (♂) or armed with several large teeth ventrolaterally (♀), tibiae unarmed, longer than femora.

mesobasitarsus as long as, metabasitarsus longer than following segments combined. All tarsal segments furrowed dorsally.

Metanotum 5 times (♂) or 3 times (♀) longer than median segment. Abdominal segment II 2 times as long as median segment, III to V of equal length and width (♂) or of equal length and widened, IV the widest, following narrowed (♀). VIII to X unarmed.

Segments VI and VII of ♂ shorter than previous segments, as wide as IX and X, VIII wider. VIII as long as X, IX as long as VII, depressed laterally, posterior margin of ♂ w-shaped. Subgenital plate prominent, swollen. Cerci strong, curved, Vomer elongated, furrowed ventroapically. Segments VI and VII of ♀ shorter than previous segments, VIII to X unarmed, VIII longer than VII, widened proximally. IX and X of equal length and width, shorter than VIII, posterior margin concave. Cerci thick and short, softly curved. Subgenital plate projecting beyond apex of abdomen, keeled ventrally. Sternite II of ♀ with praeopercularorgan.

Egg. Bullet-like, brown, with punctured texture, micropylar plate oval, half as long as capsule, short median line present. Operculum oval, flat, inserted in an angle of 45° to the capsule, covered with hairy structures.

Distribution. NW South America.

### *Pseudoceroys* Hebard, 1923

*Pseudoceroys* Hebard, 1923: 355.

Type-species. *Pseudoceroys harroweri* Hebard, 1923: 355, pl. 15: 1, 2, by original designation.

Material examined and species included. *Pseudoceroys harroweri* Hebard, 1923: 355, pl. 15: 1, 2; HT ♀, Porto Bello, Panama. August 18 to 22, 1916. (D. E. Harrower). [ANSP\*].

Diagnosis. See Hebard (1923).

Distribution. Panama.

Comments on the genus. Highly characteristic in structure of the abdominal segments VII to X: VII dilated laterally, with a strong median carina. The anterior part of VII bears a black spot on each side. The ovipositor consists of an elongated supranal and subgenital plate. The ♂ is unknown.

### *Oncotophasma* Rehn, 1904

Figs 43-44, 108-109

*Oncotophasma* Rehn, 1904: 59; Kirby, 1904: 351; Hebard, 1923: 358; *Paradiapheromera* Brunner v. W., 1907: 317; Shelford, 1909: 347; *Bostra*: Shelford, 1909: 359 (part.).

Type-species. *Bostra martini* Griffini, 1896: 10, by original designation.

Material examined and species included. *Paradiapheromera armata* Brunner v. W., 1907: 317; HT ♂, V. de Chiriqui, 4000-5000 ft. Champion; 25; Godman-Salvin Coll. 1908.-168. [BMNH\*]; *Dyme coxata* Brunner v. W., 1907: 323; HT ♂, Colombia, Staudinger. [NHMW\*]; *Bostra martini* Griffini, 1896: 10, fig. a-c: HT ♂, Foreste presso la laguna della Pita (Darien). [MIZT\*]; = *Paradiapheromera strumosa* Brunner v. W., 1907: 317; LT (here designated) ♂, Coll. Br. v. W., Chiriqui, (Panama) Staudinger; det. Br. v. W., *Paradiapheromera strumosa*; 20.587; PLT ♂, Coll. Br. v. W., Chiriqui, (Panama) Staudinger; det. Br. v. W., *Paradiaphero-*

*mera strumosa* [NHMW\*]; ♂, Gatun, Panama, VII, 28.-VIII, 5, 1916. (D. E. Harrower) [MHNG\*]; *Dyme modesta* Brunner v. W., 1907: 324; HT ♂, V. de Chiriqui, 4000-5000 ft, Champion; 34; Godman-Salvin Coll. 1908.-168. [BMNH\*]; *Bostra podagrica* Stål, 1875: 79; HT ♂, Panama. [NHRS\*], and material mentioned in the description of ♀ and egg.

Complementary description. ♂ ♀. Medium to large sized members of this group. Head longer than wide, unarmed, parallel sided; scapus flattened, longer than wide, pedicellus half as long and wide, cylindrical; antennae projecting beyond apex of abdomen by far (♂) or reaching at least abdominal segment V (♀). Head indistinctly longer and wider than prothorax, eyes projecting hemispherically. Mesonotum of ♂ elongated, at least twice as long as metanotum, considerably narrower than prothorax.

Anterior half of metanotum smooth, built normally, posterior part, at least dorsally, structured different, often rough and swollen. Mesonotum of ♀ of same width as pronotum, more than twice as long as metanotum, smooth or granulated. Profemora curved basally, three-edged, tibiae longer, probasitarsus longer (♂) or of equal length as following segments (♀), meso- and metafemora four-edged, unarmed, except for at least one ventroapical spine in the meso- and at least two in the metafemora, meso-basitarsus as long as, metabasitarsus longer than combined length of following tarsal segments. Metafemora of ♂ broadened, often with several prominent spines ventrally. All tarsal segments softly furrowed dorsally. Median segment one-third (♂) or half (♀) of length of abdominal segment II. III to VI longer than II, of equal width (♂) or wider than others (♀), VII as long as II. VIII of ♂ widened proximally, widest segment, as long as IX, longer than X. Anterior half of IX with impression laterally. Subgenital plate rounded, with broad posterior margin. Vomer broad triangular. VIII and IX of ♀ of similar length, longer than X, subgenital plate projecting apex of abdomen by length of VIII, furrowed ventroapically, lateral margins turned upwards, touching each other dorsally and building a closed tube in the posterior half. Sternite VII with praeopercular organ.

Egg. Capsule elongated, flattened bullet-like, ventral side straight, dorsal side curved, surface covered with irregular keels. Colour brown. Micropylar plate elongated oval, one-third of length of capsule, median line present, reaching polar-area. Operculum inserted in an angle of 70°, oval, with sharp, elevated margin, set with hair-like structures.

Distribution. Costa Rica to Colombia.

Comments on the genus. Hebard (1922: 358) recognized the synonymy of *Oncotophasma martini* Griffini and *Paradiapheromera strumosa* Brunner v. W. and designated the latter as type-species of *Paradiapheromera* Brunner v. W.. Shelford was obviously not aware of this and listed both names as distinct species.

The defensive-behaviour of *O. martini* (Griffini) was described by Robinson (1968). ♂♂ of this genus are easy to recognize for they are the only Diapheromerinae with a structurally divided mesonotum.

Rehn (1904: 59) gave a good diagnosis of this genus, but it only holds for the type-species, not for *O. podagricum* (Stål). It is better to characterize the metathorax as given in the complementary description above. Hebard (1933: 125) described briefly ♀♀ of this genus. The complementary description is completed by the ♀ and egg of *Oncotophasma podagricum* (Stål, 1875), described below:



*Oncotophasma podagricum* (Stål, 1875)

Material examined: 1 ♀, 1 egg: Costa Rica, Hondura 6.6.36, F. Nevermann ded., Eing. Nr. 41, 1937 [ZMUH].

Description of ♀. Yellow-brown, legs lighter.

Head roundly rectangular, depressed dorsolaterally. With a y-shaped impression between the eyes, its apices directed towards antennae. Eyes prominent, antennae projecting beyond abdominal segment IV.

Prothorax edged laterally, with fine impression medianly. Mesothorax considerably elongated, 4.5 times as long as prothorax, strongly granulated, with two parallel keels dorsomedianly. Metathorax structured equally, but less than half as long. Profemora triangular in diameter, curved basally. Meso- and metafemora in diameter quadrate, dorsally narrower than ventrally. Mesofemora at the apex ventrally with two dark spines standing one after the other, metafemora with three spines, of which the basal one is the smallest. Basitarsus half as long as the whole tarsus. Metathorax and median segment divided by a fine line. Abdominal tergites equally fine granulated and double keeled laterally. Up to IV broadened, then narrowed. VIII to X depressed laterally. X of half length as IX. Operculum projecting beyond apex of abdomen by length of IX and X combined, weakly curved upwards.

Measurements (mm). Body: 77.8; head: 4.2; pronotum: 3.9; mesonotum: 17.8; metanotum: 6.9; profemora: 18.0; mesofemora: 13.2; metafemora: 17.5.

Egg. Brown; long-oval; depressed laterally; nearly straight ventrally, weakly broadened dorsally; surface covered with narrow, irregular keels; micropylar plate long-oval, exterior margin wide, structured regularly, interior part elevated, structured irregularly, chamfered. Median line as a sharp edge reaching to the posterior part. Operculum rounded by a high keel, set with long hairs.

Measurements (mm). Total length: 3.60; length: 3.50; width: 1.45; height: 1.65.

*Trychopeplus* Shelford, 1909

Fig. 45

*Trychopeplus* Shelford, 1909: 356; Hebard, 1923: 358; *Ceroys*: Westwood, 1874: 174; *Pericentrus*: Redtenbacher, 1906: 351 (part.).

Type-species. *Pericentrus multilobatus* Redtenbacher, 1908: 352, by monotypy.

Material examined and species included. *Ceroys laciniatus* Westwood, 1874: 174, pl. 32: 4 = *Pericentrus multilobatus* (♂, nec ♀) Redtenbacher, 1908: 352; HT ♀, Nicaragua [OXUM\*]; LT of *Pericentrus multilobatus* Redtenbacher, 1908: 352 (here designated): ♀, 4th-instar nymph, det. Br. v. W., *Pericentrus multilobatus*, Collectio Br. v. W., Peru, Staudinger, 10.333 [NHMW\*] (recorded as adult ♀ by Brock, 1998: 44); *Pericentrus spinosolobatus* Redtenbacher, 1908: 353; HT ♀, Patria ?; 4; Coll. Br. v. W. ? Mus. Dresden; det. Br. v. W. *Pericentrus spinosolobatus*; 12389 [NHMW\*]; *Trychopeplus thaumasius* Hebard, 1924: 148, pl. 6: 8, 9; HT ♀, Rio Topo, near Rio Pastaza, Tunguragua, Ecuador. Elevation 4200 feet. [ANSP\*].

Complementary description. ♂ ♀. Striking species because of their bilobed and spined bodies and extremities. Head longer than wide, eyes projecting hemispherically. Vertex and occiput elevated, spinose. Scapus flat, rounded rectangular, pedicellus subcylindrical, half as long, much narrower. Following segments elongated. Antennae reaching abdominal segment V (♂) or III (♀). Prothorax shorter and narrower than



head. Mesothorax of same width as prothorax, elongated and parallel sided (♂) or abruptly widened and swollen, with strong spination. Metathorax less than half as long, spines less prominent. ♂ with squamiform tegmina and fully developed alae. Profemora curved basally, triangular in cross section, bilobed, protibiae with smaller lobes. Probasitarsus longer than following three segments, carinated dorsally. Meso- and metafemora trapezoid in cross section, especially ventral edges with prominent lobes. Meso- and metabasitarsus much longer than following segments combined. All tibiae longer than their femora. Median segment as long as metathorax. Abdominal segment II to VI of similar length, each about as long as median segment. VII shorter and - in ♀ - narrower. VIII of ♂ dilated posteriorly, IX wider, X narrower than IX; VIII as long as X, IX longer. VIII of ♀ longer than IX or X, of same width. Supra-anal plate narrow, triangular, with strong median carina. Subgenital plate elongated, curved upwards, projecting beyond tip of abdomen almost by the length of VIII to X. Cerci simple, little shorter than X, almost straight.

Egg. Hebard (1923: 360, pl. 15: 6) figures an egg of *T. laciniatus*. Capsule oval, covered with „long silky hairs“. Operculum flat, capitulum absent. This brief description is based on his figure.

Distribution. Middle America, NW South America.

Comments on the genus. As Hebard (1923: 329) mentions, Redtenbacher's nymph appears to belong to another species, but the characteristics are too underdeveloped to draw taxonomic consequences. The name "*Trychopeplus*" was taken from Brunner's unpublished notes, who was obviously planning to separate the Oriental species from the New World ones. This was not accepted by Redtenbacher, but by Shelford. In the remaining species of the Asian *Pericentrus* no ♂♂ are known. ♀♀ of *Trychopeplus* are easy to recognize by their ovipositor, which is curved upwards and projecting beyond the last tergite by more than its length. This character is absent from ♀♀ of *Pericentrus*, which might be related to *Menexenus* Stål. The ♂♂ genitals and the metamorphoses of the thorax show relations to *Oncotophasma* Rehn. ♂♂ of *Trychopeplus* are winged. The different species show a very impressionable camouflage with their lobe- or spiniform appendices on body and legs.

### *Dyme* group

Genus. *Dyme* Stål, 1875.

Characteristics. Body elongated, very slender, vertex elevated, granulated, tuberculated or spinose, ♀ with crown, body of ♂ smooth, almost shiny, of ♀ granulose. Probasitarsus as long as (♂) or few shorter (♀) than following segments, mesobasitarsus as long as following three segments combined, metabasitarsus as long as following four segments without unguis combined. Median segment short. Abdominal tergite VIII widened distally, IX widened proximally, their widest parts wider than any other abdominal segment.

Egg. See below.

*Dyme* Stål, 1875

Figs 46-47, 110-111

*Dyme* Stål, 1875: 24; Kirby, 1904: 350; Brunner v. W., 1907: 318.Type-species. *Dyme bifrons* Stål, 1875: 77, by monotypy.

Material examined and species included. *Dyme bifrons* Stål 1875: 77: LT (here designated) ♂, Collectio Br. v. W.; Peru Staudinger; 10.332; det. Br. v. W. *Dyme bifrons*; PLT ♀: Collectio Br. v. W.; Peru Staudinger; 10.331; det. Br. v. W. *Dyme bifrons* [NHMW\*]; *Libethra* (?) *palmes* Giglio-Tos, 1898: 28: HT ♂, Valle del Santiago [MIZT\*]; *Dyme rarospinosa* Brunner v. W. 1907: 327: ST 1 ♀, Peru, Santo Domingo, 6.000 ft. Rosenberg. [NHMW\*]; 1 ♀, Peru, Marcapata, Staudinger. [NHMW\*]; 1 ♀, Chile, Staudinger. [NHMW\*].

Complementary description. ♂ ♀. Body strongly elongated. Head softly elevated dorsally, with small granula (♂) or a crown of spines or tubercles (♀), longer than wide. Scapus flat, broad, fewly wider than long, pedicellus subcylindrical, antennae projecting abdominal segment IV (♂) or reaching III (♀). Pronotum as long and wide as head. Thorax strongly elongated, more than 20 times as long as wide, smooth (♂), or 9 times as long as wide, granulated, with median line (♀). Metanotum as mesonotum, more than half of its length long. Profemora curved basally, three-edged, protibiae longer, probasitarsus as long as (♂) or fewly shorter than combined length of following segments. Meso- and metafemora four-edged, sometimes with indistinct tubercle ventroapically, tibiae longer, mesobasitarsus as long as following four segments without unguis (♂) or following three segments combined, metabasitarsus as long as following segments combined. Median segment less than one sixth as long as metanotum. Abdominal segment II twice as long as median segment, III 2.5 times as long as II, IV longer, IV to IV (♂) or IV to VII (♀) of equal with. Sides of abdomen subparallel, of same width as thorax in both sexes. VII of ♂ as long as II. VIII of ♂ broadened distally, as long as IX, IX anteriorly as wide as posterior part of VIII, narrowed distally, margins turned downwards, approximated, but not touching, ventrally, X of equal length, posterior margin acute concave. Subgenital plate prominent, depressed laterally, with prominent ventromedian carina, marginated posteriorly. VIII of ♀ little shorter than combined length of IX and X, these of equal length. Subgenital plate broad, bluntly rounded, shorter than apex of abdomen.

Egg. Capsule rounded rectangular, flattened laterally, covered with irregular broad bulges. Micropylar plate elongated, oval, measuring one half of length of capsule. Anterior margin of capsule broadly marginated. Operculum suboval, median part structured as capsule.

Distribution. NW South America.

Comments on the genus. The relation between length and width of the mesothorax and the characteristic structure of the egg separates this group from the previous one. It is not obvious which are the nearest relatives; though most of the characters prove relation to the *Clonistria* group, the flattened and broad eggs are similar to those of the Ocnophilini. The types of *D. bifrons* are figured by Brunner v. W., 1907: 322, pl. 14: 3a ♂, b ♀.

Brunners comment (1907: 318) „Die Weibchen sind von denjenigen des Genus *Bacillus* schwer zu unterscheiden“ is hard to understand, because *Bacillus* is a member of the Areolatae. His *Dyme* contains heterogenous species.

Bradley & Galil (1977) consider *Dyme* as a synonym of *Pseudobacteria*. The latter genus, a synonym of *Bacteria*, is a member of the *Bacteria* group.

#### OCNOPHILINI

Genera. *Dubiophasma* gen. n.; *Exocnophila* gen. n.; *Ocnophila* Brunner v. W., 1907 (= *Parapygirhynchus* Brunner v. W., 1907, syn. n.); *Ocnophiloidea* gen. n.; *Parocnophila* Zompro, 1998.

Characteristics. This tribe includes several common characters. It includes small to medium-sized phasmids.

Ocelli absent. Thorax and abdomen of ♀♀ bear several longitudinal carinae. Profemora curved basally, triangular, meso- and metafemora rectangular, not trapezoid, in cross section, unarmed. Basitarsus strikingly short, as long as 3 following segments combined, carinated. Abdomen often not longer or indistinctly shorter than thorax, both sexes of similar body length. ♂ with vomer, poculum prominent, swollen. Lateral margins of IX and X of ♂ turned downward.

Eggs often very large in relation to body size. Micropylar plate surrounded by a broad, whitish margin, placed at an angle of 90° to the operculum, capitulum absent.

#### Key to the genera of Ocnophilini

♂♂

- 1 Vertex armed. . . . . 2
- Vertex unarmed. . . . . *Parocnophila*
- 2 Posterolateral corners of abdominal segment VIII wider than IX. . . . *Ocnophila*
- VIII in its widest part at best as wide as IX. . . . . *Ocnophiloidea*

♀♀

- 1 Supra-anal- and subgenital plate small, hardly visible. . . . . 2
- Supra-anal- or subgenital plate elongated. . . . . 4
- 2 Abdominal segment X longer than VIII. . . . . *Dubiophasma*
- Abdominal segment X as long as or shorter than VIII. . . . . 3
- 3 Abdominal segments IX as long as X, VIII longer. . . . . *Ocnophiloidea*
- Abdominal segments VIII to X of similar length. . . . . *Exocnophila*
- 4 Vertex armed. . . . . *Ocnophila*
- Vertex unarmed. . . . . *Parocnophila*

Eggs

- 1 Micropylar plate cordiform. . . . . 2
- Micropylar plate oblong-oval. . . . . 3
- 2 Micropylar plate half as long or longer than capsule. . . . . *Parocnophila*
- Micropylar plate less than half as long as capsule. . . . . *Ocnophiloidea*
- 3 Capsule irregular in shape. . . . . *Dubiophasma*
- Capsule oval or roundly rectangular in shape. . . . . 4
- 4 Operculum round. . . . . *Exocnophila*
- Operculum oval, with longitudinal median impression. . . . . *Ocnophila*

*Ocnophila* Brunner v. W., 1907

Figs 59-60, 112-113

*Ocnophila* Brunner v. W., 1907: 309; *Parapygirhynchus* Brunner v. W., 1907: 316, syn. n.

Type-species. *Ocnophila integra* Brunner v. W., 1907, by subsequent designation of Hebard 1919: 163.

Material examined and species included. *Ocnophila integra* Brunner v. W., 1907: 313, pl. 14: 1 (♂, nec ♀, described as *Exocnophila exintegra* g. n. sp. n. below): LT (by present designation) ♂, Coll. Br. v. W., Porto Cabello, Thorey; det. Br. v. W. *Ocnophila integra*; 1399 [NHMW\*]; 2 ♂♂, 2 ♀♀, several eggs: Venezuela, Maracay, Estacion Rancho Grande, autumn 1995, leg. D. Münch, ex culture O. Zompro [OZ\*]; = *Parapygirhynchus catenatus* Brunner v. W., 1907: 316, syn. n.: HT ♀, Porto Cabello, Venezuela [ZMUH\*]; *Pygirhynchus iphiclus* Westwood, 1859: 58, pl. 2: 2: ST ♂, no data [BMNH\*], ST ♀, Colombia & Venezuela [BMNH\*]; *Acanthoderus scabrosus* Burmeister, 1838: 569: ST ♂ ♀, Brasilien. [ZMHB\*].

Complementary description. Head roundly rectangular, slightly narrowed posteriorly, vertex with small spines (♂) or spiny lobes (♀). Eyes small, projecting hemispherically. Scapus flat, considerably (♂) or slightly (♀) shorter than wide. Pedicellus subglobose, of half length and narrower. Antennae reaching abdominal segment VI (♂) or II (♀). Prothorax as long and wide as head, tuberculated or spiny. Mesothorax of ♂ slender, narrower than prothorax, very elongated, of ♀ wider than prothorax, mesosternum with median carina. Metanotum two-thirds of mesonotum, with equal structure. Profemora curved basally, triangular in cross section, tibiae longer than femora, probasitarsus much shorter than following segments together. Meso- and metafemora rectangular in cross section, tibiae longer, basitarsus with dorsal carina, as long as following three segments together. Median segment one-quarter or less as long as metathorax. Abdominal segment II twice as long as median segment. III longer than II, III to VI (♂) or III to VII (♀) of equal length. Abdomen of ♀ with several longitudinal carinae. VII of ♂ shorter than VI; VIII widened posteriorly, posterior margin wider than IX. IX longer than VIII, VIII longer than X. X emarginated posteriorly. Poculum bulgy, marginated posteriorly. Vomer present. Cerci short, curved, broadened apically. VIII of ♀ longer than IX, IX longer than X. Supra-anal plate elongated, spoon-like, with dorsal carina. Subgenital plate flat, not projecting X. Cerci short, flat.

Egg. Shape of capsule from lateral rounded rectangular, flattened laterally, structured by irregular keels (30x). Operculum acute oval, with risen, roughly structured area medianly. Micropylar plate of half length as capsule, with broad, whitish margin.

Distribution. Northern South America.

Comments on the genus. The ♂♂ of Brunner v. W.'s *Ocnophila integra* are conspecific with *Parapygirhynchus catenatus* of the same author, described after a single ♀, both derive from Venezuela, Porto Cabello. Type-species of *Parapygirhynchus* Brunner v. W., 1907 is *Parapygirhynchus catenatus* Brunner v. W., 1907, by present designation. The ♀ of *O. integra* belongs to a different species and genus, described below. *Ocnophila integra* is present in the author's cultures, so the synonymy is doubtless. Species and genus of *O. integra* were described before *P. catenatus* and are therefore valid. The ♂ of *O. integra* is presently chosen as LT, consequently *Parapygirhynchus* Brunner v. W. falls as a synonym of *Ocnophila* Brunner v. W.



Up to now, 33 species have been described in this genus, 9 of them by Brunner v. W. himself in his monograph. None of the described ♀♀ shows the morphology of the genitalia described in the complementary description below. In a revision on species-level all of them will have to be placed in other genera.

***Exocnophila* gen. n.**

Figs 64, 120-121

Type-species. *Exocnophila exintegra* sp. n.

Species included. *Exocnophila exintegra* sp. n. (see below).

Diagnosis. ♀. This large species of Ocnophilini resembles at first view *Ocnophiloidea*, but differs in the length ratios of the abdominal segments VIII to X and, especially, in egg structure. It is to hope that the ♂ will be found to increase the knowledge in this difficult group of Phasmatodea.

Large member of Ocnophilini. Head longer than wide, vertex elevated, posterior half with two elevated tubercles medianly and irregular rows of small granula. Scapus flat, dilated laterally in round lobes which are turned ventrad. Pedicellus less than half as long and wide. Antennae broken, supposedly reaching abdominal segment III. Prothorax as long as head, with strong, transverse median furrow. Mesothorax strongly elongated, more than 4 times as long as prothorax, of equal width, with indistinct median carina and few tubercles. Metathorax half as long, with same structure. Profemora curved basally, triangular in cross section, edges with high carinae. Meso- and metafemora rectangular in cross section, unarmed. All tibiae longer than femora, all basitarsi as long as following three segments combined. Metathorax more than 6 times as long as median segment, this one-third as long as abdominal segment II. III longer than II, IV longer than III, as long as V, these the widest segments, VI as III and VII as II. Tergites posteromedian, sternites with a tubercle submedianly. II to IX with six longitudinal carinae submedianly, median carina absent. VIII shorter than VII, as long as IX, X longer than IX, with median carina. Lateral margins of VIII to X turned ventrad. Praeopercular organ on sternite VII present, subgenital plate flat, boat-like, with submedian carina. Cerci short, simple.

Egg. See below.

Derivatio nominis. The name shall refer to „made out of *Ocnophila integra*“.

***Exocnophila exintegra* sp. n.**

Figs 64, 120-121, 136

Material examined. HT ♀, 2 eggs ex abdomen, Espirito Santo, Brasil, ex coll. Fruhstorfer; Collectio Br. v. W.; det. Br. v. W. *Ocnophila integra*; 20.264 [NHMW\*]; PT ♀, Coll. Brunner v. W., Brasilien, Mus. Bern; det. Br. v. W. *Ocnophila integra*; 14978 [NHMW\*]; both formerly ST of *Ocnophila integra* Brunner v. W., 1907.

Description. ♀. General colour brown. Head considerably longer than wide, flat, vertex tuberculous, with two prominent spines submedianly. Eyes projecting hemispherically, genae 4 times longer. Scapus prominent, flat, rectangular, with two longitudinal impressions dorsosubmedially. Pedicellus one-third as long and two-thirds as wide, subcylindrical. Following antennal segments elongated, half as wide as pedicellus. Prothorax as long as head, anterior half narrower than posterior one. Anterior margin prominent and wide. Anterior half with deep impressions laterally. With deep

transversal furrow medially. Surface tuberculate, in the posterior half with two submedian diverging rows of larger tubercles. Mesothorax 4.5 times as long as prothorax, tuberculate, with strong median and weaker submedian carinae. Metathorax as previous segment, but half as long, submedian carinae in the last third curved upwards. Profemora curved basally, triangular in cross section. Meso- and metafemora rectangular in cross section, edges carinated. Basitarsi as long as following three segments combined, terminal segment longer. All tarsal segments with rounded dorsal carina.

Median segment less than half as long as abdominal segment II, II to V increasingly longer and wider, IV widest, VI as long as V, VII as III. VII to X of similar width, margins almost parallel. VIII as long as X, IX slightly shorter. Three terminal segments combined as long as combined length of VI and VII. Median segment up to segment IX with two parallel carinae dorsally and a submedian one dorsolaterally. Lateral margin with a carina and an indistinct one slightly above. III with a prominent spine posterodorsomedianly, IV and V with a smaller or indistinct one. X with curved lateral margin and median carina. Sternites structured as tergites, but III to V without posterior spine, VII with praepopular organ. Subgenital plate with two sharp carinae ventrolaterally, its tip rectangular, reaching middle of X. Cerci short and flat.

Antennae broken in both types, in HT left meso- and metatarsus missing, in PT only right foreleg and half left metafemur present. The measurements of the larger specimen are taken from the holotype.

Measurements (mm). Body: 68.1- 69.5, head: 4.4-4.6; prothorax: 3.3-4.0; mesothorax: 17.2-18.2; metathorax: 8.8-9.7; median segment: 1.8-2.0; profemora: 20.0; protibia: 24.1; mesofemora: 15.3; mesotibia: 16.8; metafemora: 19.0; metatibia: 24.0.

Egg. Capsule brown, oval, rounded, slightly depressed laterally, with leather-like structure (30x). Micropylar plate projecting, elongated, two-thirds as long as capsule, with broad, doubled, whitish margin. Operculum flat, round, smooth, marginated.

Measurements (mm). Length: 2.25; width: 1.50; height: 1.75.

### *Ocnophiloidea* gen. n.

Figs 61-62, 114-115, 137-138

*Libethra*: Brunner v. W., 1907: 303 (in part.).

Type-species. *Libethra regularis* Brunner v. W., 1907: 308, by present designation.

Material examined and species included. *Libethra regularis* Brunner v. W., 1907: 308; LT (by present designation) ♀, Port of Spain (Trinidad), Prof. O. Burger leg., vend. 1.1.1898 [ZMUH\*]; PLT ♀, Port of Spain. Mus. Hamburg [NHMW\*]; ♂: Caparo, Trinidad, VIII. 1913, S. M. Klages (*Parapygrrhynchus regularis* Redt.), det. Hebard 1926 [NHMW\*]; 7 ♂♂, 6 ♀♀, several eggs, ex culture O. Zompro, origin: Trinidad [OZ\*].

Diagnosis. Typical, small *Ocnophilini*. The ♀♀ differ from those of the closest related genus *Ocnophila* by the absence of an elongated supra-anal plate, the ♂♂ in the equal width of tergites VIII to X; in *Ocnophila* VIII is considerably broader than the following segments. The eggs differ by the shape of the capsule and the cordiform micropylar plate.

Head longer than wide, vertex bispinose and tuberculated; eyes projecting. Scapus strikingly flat, almost as long as wide, pedicellus half as wide and long, cylindrical. Prothorax as wide and long as head. Body of ♀ with several longitudinal carinae. Mesothorax of ♂ slightly narrower than prothorax, elongated, of ♀ wider than prothorax. Metathorax structured as mesothorax, little more than half as long. Profemora curved basally, triangular in cross section, carinae flat and high. Tibiae one-third longer, probasitarsus hardly as long as following three segments together. Meso- and metafemora rectangular in cross section, unarmed. Meso- and metabasitarsus as long as combined length of following two segments. Median segment less than one-quarter of length of metanotum. Abdominal segment II twice as long as median segment, III slightly longer, IV to VI longest, of equal length to each other, VIII as long as III. IV and V of ♀ widest segments. VIII of ♂ dilating posteriorly, keeled dorso-medially, IX as wide as dilated part of VIII, longest of the terminal segments, narrowed posteriorly, X shorter than VIII, posterior margin with a notch. Cerci very short, hidden in X, vomer present. Subgenital plate bulgy, posteroventral with a transverse edge, margined posteriorly. VIII of / almost as long as IX and X together, these of similar length. Supra-anal plate visible as small, transverse stripe. Cerci short, but strong, subgenital plate flat, not projecting X, in the type with a notch posteriorly.

Egg. Capsule oval, flattened laterally, with two longitudinal impressions on each side. Micropylar plate cordiform, with wide whitish margin, median line present. Operculum flat, without differentiated structures.

Distribution. Trinidad.

### *Dubiophasma* gen. n.

Figs 63, 116-117, 139

Type-species. *Dubiophasma longicarinatum* sp. n. by present designation.

Species included. *Dubiophasma longicarinatum* sp. n.: HT ♀ (see below).

Diagnosis. ♀. The habitus of this genus appears very similar to the genus *Pseudosermyle*, which is a member of Diapheromerini, but easy to be distinguished by the trapezoid cross section of the meso- and metafemora. The eggs show further differences. The nearest relative in the Ocnophilini seems to be *Parocnophila*, which agrees in the head and egg structure, but differs in that of the genitalia. Interestingly, the specialized cerci which might prove useful for egg-laying.

Large members of Ocnophilini. Head strikingly slender, unarmed. Scapus flat, broad, dilated laterally. Pedicellus half as long and wide. Antennae projecting beyond median segment; they are broken in the only specimen, the exact length is unknown. Thorax and abdomen with several longitudinal carinae. Pronotum slightly wider than head, of equal length, mesonotum more than 4 times as long, wider, 1.5 times as long as the following metanotum. Profemora curved basally, triangular in cross section, edges lobiform. All tibiae longer than femora. Meso- and metafemora rectangular in cross section, unarmed. Mesobasitarsus as long as following three segments combined. Metanotum 5 times longer than median segment, abdominal segment II more than twice as long. III longer, of equal length as each of the following IV to VI, VII as II, VIII and IX narrower, of equal length and width, considerably shorter than VII. X of same width,

but almost as long as VIII and XI together. Subgenital plate flat, hardly projecting X. Cerci long, projecting tip of abdomen by the length of IX, specialized.

Egg. Capsule with irregular impressions laterally, plain dorsally, impressed ventrally by the micropylar plate. This is two-thirds as long as capsule, oval, with whitish margin.

Operculum flat, round, with rough structure and round impression medially.

Derivatio nominis. The name „*Dubiophasma*“ relates to the difficulties this insect caused whilst working on this paper.

***Dubiophasma longicarinatum* sp. n.**

Figs 63, 116-117, 139

Material examined. HT ♀, several eggs ex abdomen, Salina Cruz, Mexico, R. Paessler leg. 3.-5.VIII.1909. ded. 1.II.1910, PHA 16, ZMUH [ZMUH\*].

♀. Body colour light brown. Thorax and abdomen with longitudinal carinae. Head strikingly slender, narrower than posterior half of pronotum. Eggs small, projecting less than hemispherical. Genae 4 times as long as diameter of the eyes. Head smooth, unarmed. Scapus flat, 1.5 times as long as wide, dilated laterally. Pedicellus half as wide and long, cylindrical. Following segments irregularly elongated. Tip of antennae broken. Prothorax as long as head, but in the posterior half wider, with transversal furrow medianly, marginated laterally. Mesonotum more than 4.5 times as long as prothorax, with one median and two submedian carinae on each side. Mesosternum with a median and one submedian longitudinal carina medially, too. Metanotum structured equally, but wider, mesonotum 1.5 times as long. Profemora curved basally, triangular in cross section, edges produced as high lobes. All tibiae four-edged, longer than profemora. Right fore leg missing. Meso- and metafemora rectangular in cross section, unarmed. All tarsi except for left mesotarsus missing. Mesobasitarsus as long as following three segments together, carinated. Metathorax more than 5 times as long as median segment, abdominal segment II slightly longer than 2 times as the previous one. Tergites and sternites of abdomen with five longitudinal carinae, one of them medially, the others submedially. III longer than II. III to VI of similar length. III and IV widest segments. VII as long as II, narrowed posteriorly. VIII and IX narrower, of equal length and width. X little shorter than VIII and IX together, slightly narrower. Posterior margin with slight emargination. Subgenital plate slightly projecting beyond IX, flat, acute. Cerci projecting by the length of IX, tapering.

Measurements (mm). Body: 79.8; head: 3.8; pronotum: 3.8; mesonotum: 18.1; metanotum: 11.1; median segment: 2.0; profemora: 22.0; protibia: 25.1; mesofemora: 19.7; mesotibia: 21.9; metafemora: 22.7; metatibia: 28.6.

Egg. Capsule brown, plain ventrally. Micropylar plate impressed in middle, subcordiform, with broad, whitish margin.

Measurements (mm). Length: 2.5; width: 1.2; height: 1.65.

Derivatio nominis. The name of the species refers to the long carinae on the thorax and abdomen.



*Parocnophila* Zompro, 1998, stat. n.

Figs 65-67, 118-119, 140-141

*Ocnophila* (*Parocnophila*) Zompro, 1998: 457.

Type-species. *Ocnophila* (*Parocnophila*) *carinata* Zompro, 1998: 458, by original designation.

Material examined and species included. *Ocnophila* (*Parocnophila*) *carinata* Zompro, 1998: 458, fig. 2: HT ♀, Venezuela, Bejuma, Casa Maria [OZ 364-1\*]; *Parocnophila latirostrata* sp. n. (see below).

Origin. Venezuela.

Complementary description. Head longer than wide, unarmed, except for some small furrows in the posterior quarter. Scapus flat, half times as (♂) or almost as wide as (♀) long, pedicellus half as long and slightly narrower (♂) or half as wide (♀), antennae reaching abdominal segment VIII (♂) or posterior half of II (♀). Prothorax slightly shorter than head, of same width. Mesothorax elongated, narrower than (♂) or wider than (♀) prothorax. Metathorax structured as mesothorax, two-thirds as long (♂) or half as long (♀) as mesothorax. Profemora curved basally, triangular in cross section, with high carinae, meso- and metafemora rectangular in cross section, unarmed. Tibiae longer. All basitarsi as long as following three segments combined. Median segment shorter than one-quarter of metathorax, about one-third as long as abdominal segment II. III longer than II, III to V (♂) or III to VI (♀) of similar length, III and IV of ♀ widest. VI of ♂ as long as II, VII shorter. VIII widened, as wide and long as IX, X emarginated posteriorly, shorter than the previous segments. Subgenital plate bulgy, with short ventral carina, posterior margin emarginated. Vomer prominent, apex obtuse, cerci slender, slightly curved. VII of ♀ slightly shorter than VI, VIII as long as IX and X combined, these of equal length, supra-anal plate elongated, not separated from X visibly, with carina dorsomedianly. Subgenital plate flat, in the type with a notch posteriorly, in *P. latirostrata* n. sp. rounded. Cerci curved.

Egg. Capsule rectangular from lateral with undulate ventral and dorsal sides, with four deep and wide impressions laterally, micropylar plate round, with broad, whitish margin. Operculum oval, flat.

Distribution. NW South America.

Comments on the genus. *Parocnophila* was erected as a subgenus of *Ocnophila* Brunner v. W.; ♂ and egg were unknown. The description of the new species below, including ♂ and egg, shows significant differences to *Ocnophila*, so the full generic rank seems justified.

### Key to the ♀♀ of *Parocnophila*

- 1     Supra-anal plate as long as VIII. . . . . *P. carinata* Zompro
- Supra-anal plate shorter, as long as IX. . . . . *P. latirostrata* sp. n.

*Parocnophila latirostrata* sp. n.

Figs 66-67, 118-119

*Libethra* sp. Potvin, 1993: 59 fig. 1-3.

Material examined. 2 ♂♂, 2 ♀♀, 10 eggs. 1 ♂, HT, 1 ♀, PT, 10 eggs: Ex culture I. Fritzsche [OZ 432-1, 2\*]; 1 ♂, ♀, PT, Ex culture W. Potvin, 1993 [F. H. Hennemann]. Origin of culture-stock: Ecuador.

♂. General colour brown. Head considerably longer than wide, unarmed, posterior margin tuberculose, disturbed by four short furrows. Whith a black, transverse stripe before, and a lighter spot between eyes. Genae darker. Scapus long, flattened subcylindrically, with a strong carina exteriorly. Pedicellus half of its length, two-thirds of its width, cylindrical. Antennal segment III 3 times as long as scapus and pedicellus combined, following ones elongated, but growing shorter. Antennae of lighter colour, with irregular black annulation, reaching abdominal segment VIII. Prothorax slightly shorter than head, with cross-like impression. Mesothorax almost 6 times as long, narrower, smooth, with few indistinct, darker tubercles. Metanotum with same structure, two-thirds as long. Profemora curved basally, triangular in cross section, edges elevated, bristled. Protibiae one-quarter longer, subrectangular, with bristled carinae. Probasitarsus as long as three following segments together, with a strong median carina. Meso- and metafemora rectangular in cross section, furrowed dorsally, unarmed. Tibiae like protibiae. Meso- and metabasitarsus like probasitarsus. Metathorax and abdomen with an indistinct, darker, dorsomedian line. Metathorax 8 times longer than median segment, latter one-third as long as abdominal segment II. II to V of equal length, VI shorter, VII shorter than VI. Segments VIII and IX almost rectangular, both as long as VII, with four longitudinal carinae dorsally. The interior two are placed submedially and evenly bristled. The exterior ones on VIII diverging posteriad, on IX with a curve directed mediad in the anterior half, its posterior corners produced and directed downward. Segment X shorter, with one median and two diverging longitudinal carinae, posterior margin emarginated. Subgenital plate bulgy, as high as tergite VIII, with flat but broad posterior margin. Vomer round with an obtuse, simple apex. Cerci simple, slightly curved.

Measurements (mm). Body: 49.8; head: 2.2; pronotum: 2.1; mesonotum: 12.9; metanotum: 8.6; median segment: 1.0; profemora: 16.1; mesofemora: 13.1; metafemora: 16.8.

♀. General colour light brown. Head considerably longer than wide, with two tubercles posterosubmedially, eyes projecting. Scapus very flat and wide, dilated into flat lobes laterally. Pedicellus subcylindrical, half as long and half as wide. Following segments light brown, elongated, but of irregular length, apex darker, reaching posterior half of abdominal segment II. Prothorax with an interrupted median carina, shorter than head. Mesothorax more than 3 times as long, with one median and two submedian carinae. Metathorax half as long, of equal structure. Profemora curved basally, triangular in cross section, edges elevated, bristled. All tibiae four edged, edges bristled, longer than femora. All basitarsi as long as following three segments combined, carinated. Meso- and metafemora rectangular in cross section, unarmed. Metanotum 6 times as long as median segment, abdominal segment II 2.5 times as long as latter. III

to VI of equal length, longer than II. VII as long as II. Sternite VII with v-like opercular organ. VIII as long as IX and X combined. Segments II to IX dorsal with six longitudinal carinae, all placed submedially, median carina absent. Supra-anal plate elongated, with a prominent median carina, a little longer than IX. Subgenital plate flat, in posterior half with a short median carina, not projecting beyond X.

Measurements (mm). Body: 55.1; head: 3.4; pronotum: 3.0; mesonotum: 14.0; metanotum: 7.0; median segment: 1.2; profemora: 15.6; mesofemora: 12.7; metafemora: 20.5.

Egg. Capsule rectangular in lateral view, compressed, grey, rough, each side with four, irregular, brown, deeper impressions. Micropylar plate with a broad, white and very rough margin, inner part black, more smooth. Dorsal edge undulate. Ventral side with an irregular, net-like structure of brown and grey. Operculum oval, flat.

Measurements (mm). Length: 3.14; width: 2.12; height: 1.30.

Comments. Potvin (1993) gives a description and figures of this species and its egg and adds some notes on rearing and behaviour.

#### OREOPHOETINI trib. n.

Genus included. *Oreophoetes* Rehn, 1904 (= *Allophyllus* Brunner v. W., 1907).

Comments on the Oreophoetini. In contrast to Rehn (1904: 56), Brunner v. W. (1907: 317) recognized that the character which separates this genus from all others of Diapheromerinae is, the basically straight, non-curved profemora. However, in cross section they are not round, but roundly quadrate. These straight, not curved profemora are unique in this tribe.

The egg differs strikingly from that of the other tribes: In longitudinal cross section it is rhombic because of its lateral bulges. The micropylar plate reaches from the anterior to the posterior end and is almost parallel-sided. The operculum is rhombic, too, almost flat, and touches the micropylar plate in its anterior end. A capitulum is not present.

Some hints show a closer relationship to the Ocnophilini, e.g., the similar body length of both sexes, the meso- and metafemora which are unarmed and rectangular in cross section, and the lack of a capitulum in the eggs.

The species of *Oreophoetes* are highly specialized phasmids feeding on ferns in montane regions of western South America.

#### *Oreophoetes* Rehn, 1904

Figs 68-69, 122-123

*Oreophoetes* Rehn, 1904: 56; Giglio-Tos, 1910: 31; *Allophyllus* Brunner v. W., 1907: 317.

Type-species. *Bacteria peruana* Saussure, 1868: 65, by original designation.

Material examined and species included. *Bacunculus mimus* Giglio-Tos, 1898: 25: ST 1 ♀, Gualaquiza. [MIZT\*]; *Bacteria nigripes* Scudder, 1875: 278 [ANSP\*]; *Bacteria peruana* Saussure, 1868: 65: ST 1 ♂, Iquitos, Perou, 600/81, Anc. coll.; [MHNG\*]; ST 1 ♂, Perou. [MHNG\*]; 1 ♂ ♀, Baños, Ecuador. [MHNG\*]; LT ♀ *Bacunculus festuca* Giglio-Tos, 1898: Valle del Santiago [MIZT\*], designated by Brock, 1998a: 302; *Bacunculus gramen* Giglio-Tos,

1898: 26: HT ♂, Valle de Santiago. [MIZT\*]; ♀, no data [MHNG\*]; 2 ♂♂, ♀, Santa Inez (Ecuad.), R. Haensch S. [ZMUH\*]; ♂, Ecuador, Barancas, 16.XII.1905 [ZMUH\*]; ♀, Ost-Ecuador, Riobamba-Macas und flussabwärts. E. Feyer leg. [ZMUH\*]; 4 ♂♂, 3 ♀♀, several eggs, Culture O. Zompro, origin: Peru. [OZ\*].

Origin. Peru, Ecuador.

Complementary description. Small to medium sized, very colourful phasmids. Head subglobose, slightly flattened and longer than wide. Eyes very small, projecting hemispherically. Antennae much longer than body. Scapus flattened, rounded rectangular, pedicellus half as long and wide, rounded cylindrical. Prothorax as long and wide as head. Mesonotum twice as long as metanotum, of similar width as pronotum. Profemora straight, not curved basally. Protibiae longer than femora, probasitarsus longer than combined length of following segments. Meso- and metafemora rectangular in cross section. Mesobasitarsus slightly shorter, metabasitarsus as long as following segments combined. Median segment shorter than one-quarter of metanotum. Abdomen shorter than thorax. Abdominal segment II twice as long as median segment. II to VII of similar width, VII slightly shorter or of equal length. VIII of ♂ as long as X, IX longer. Segment VIII slightly widened posteriorly, IX with dorsomedian carina, X with a notch posteriorly. Subgenital plate bulgy, with prominent margin posteriorly. Vomer prominent. Cerci straight to slightly curved. VIII of ♀ indistinctly wider than VII, longer than IX or X. X as long as IX. Cerci strong, straight. Subgenital plate boat-like, acute, with carina ventromedially.

Egg. Capsule almost round from lateral, with leather like structure (20x). Capsule rhombic in cross section from dorsal view. Operculum oval, long, flat, without capitulum. Micropylar plate elongated, reaching from operculum to polar area.

Distribution. NW South America.

#### GENERA INCERTAE SEDIS.

#### *Bactricia* Kirby, 1896

*Bactricia* Kirby, 1896: 463; *Scaphegyna* Karsch, 1898: 366.

Type-species of *Bactricia* Kirby, 1896: *Bacteria trophinus* Westwood, 1859: 30, pl. 5: 5, by original designation.

Type-species of *Scaphegyna* Karsch, 1898: *Bacteria bituberculata* Schaum, 1857: 423, by monotypy.

Distribution. Africa, Mozambique.

Discussion. Karsch suggested (1898: 367) that *B. bituberculata* is the ♀ of *Bacteria trophinus* Westwood. Consequently, *Scaphegyna* Karsch falls as a synonym of *Bactricia* Kirby, 1896.

The dorsally furrowed tibiae of this genus and species also occur in the African genus *Palophus* Westwood, 1859. Possibly *Bactricia* is a member of the African Palophinae. Especially the morphology of the legs resembles other species of this subfamily. Exact statements on the taxonomic position of this genus should not be made before revising the Palophinae.



*Pseudobactricia* Brock, 1999

*Pseudobactricia* Brock, 1999: 26.

Type-species: *Bactricia ridleyi* Kirby, 1904c: 429, by original designation.

Distribution. Singapore.

Discussion. The whole genus is only known from the holotype, figured by Brock 1999: 27, fig. 10a-c. This very slender species is striking because of its prominent lobes behind the eyes. It is related to *Bactricia* Kirby. The correct taxonomic position is unclear, it might be a member of Palophinae as well as Diapheromerinae. Final conclusions should not be drawn before a revision of the Palophinae.

## SUMMARY

The genera in the North and South American phasmatodean Diapheromeridae: Diapheromerinae (= Heteronemiinae sensu Bradley & Galil) are rediagnosed and revised. The subfamily is split into three tribes, Diapheromerini, Ocnophilini, and Oreophoetini, while the names Libethrini and Heteronemiini sensu Bradley & Galil are considered as a synonym of Diapheromerini, as their type species and genera are typical members of the latter tribe. The tribes are subdivided into groups of genera, keys to males, females and eggs of all groups, genera and tribes are included. The type-species of all genera are listed or designated for *Phantasca* Redtenbacher, 1908, and *Parapygirhynchus* Brunner v. W., 1907.

Within the Diapheromerini, seven new genera are erected: *Paraphanocles* gen. n., *Alienobostra* gen. n., *Globocalynda* gen. n., *Paracalynda* gen. n.; *Caribbiophomera* gen. n., *Rugosolibethra* n. n., and *Spinopeplus* gen. n.. *Caribbiophomera jamaicana* sp. n., the ♂ of *Calynda coronata* Carl, 1915, and the ♀ and egg of *Oncotophasma podagricum* (Stål) are described.

The Ocnophilini differs from the other tribes in the meso- and metafemora being rectangular, and not trapezoid, in cross section and the strikingly short tarsal segments. It includes three new genera, *Dubiophasma* gen. n., *Ocnophiloidea* gen. n., and *Exocnophila* gen. n.. *Parapygirhynchus* Brunner v. W., 1907, is a synonym of *Ocnophila* Brunner v. W., 1907, syn. n.; their type-species are just different sexes of one species. *Dubiophasma longicarinatum* sp. n., *Exocnophila exintegra* sp. n. and *Parocnophila latirostrata* sp. n. are described.

The Oreophoetini with the single genus *Oreophoetes* Rehn differ from the other tribes in respect of the straight profemora and egg structure.

Lectotypes are designated for *Dyme bifrons* Stål, 1875, *Dyme discors* Brunner v. W., 1907, *Ocnophila integra* Brunner v. W., 1907, *Pericentrus multilobatus* Redtenbacher, 1908, *Libethra nisseri* Stål, 1875, *Bacunculus praetermissus* Brunner v. W., 1907, *Libethra regularis* Brunner v. W., 1907, *Calynda simplex* Brunner v. W., 1907 and *Bacteria turgida* Westwood, 1859.

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PLATE I

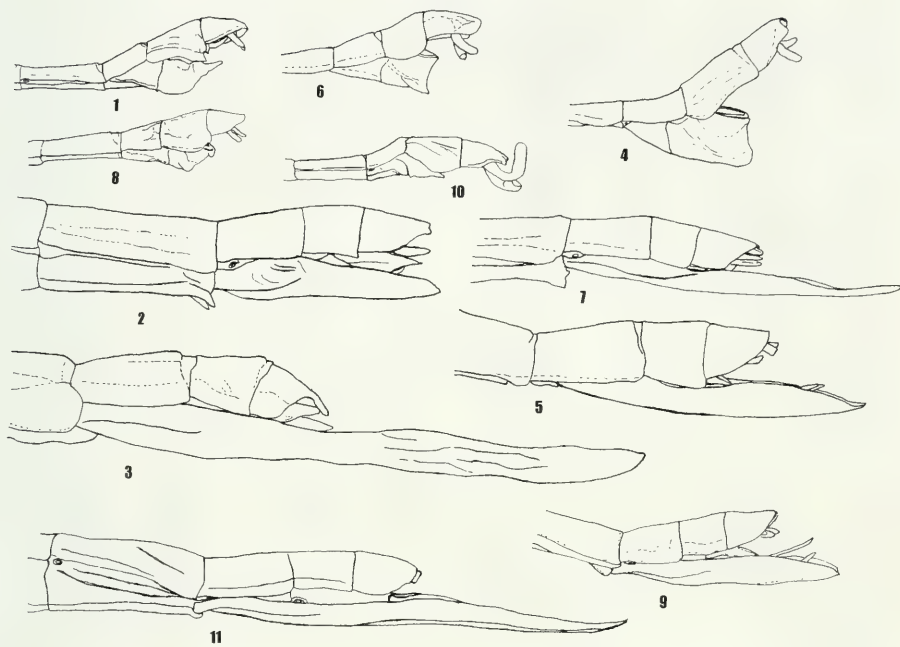


PLATE II

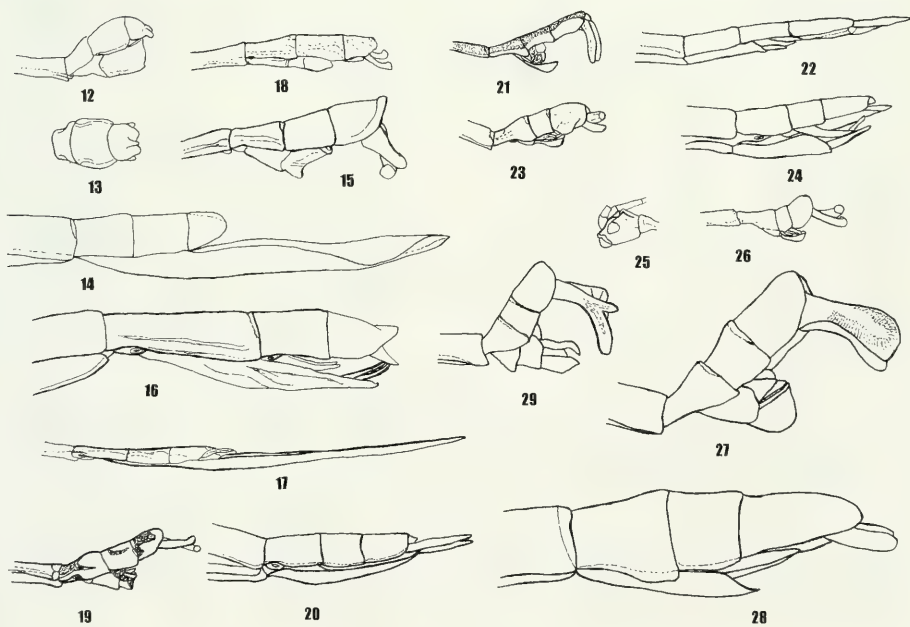


PLATE III

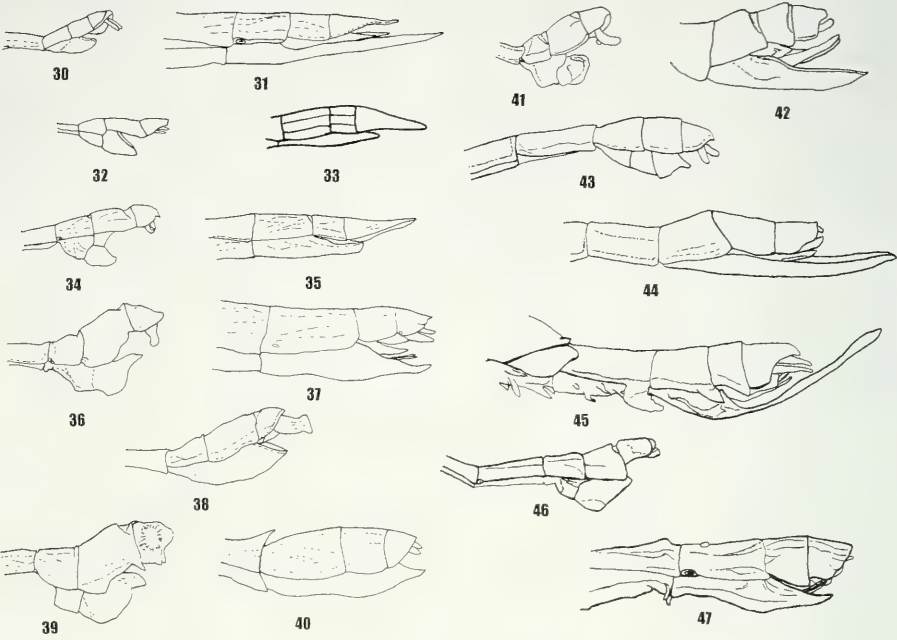
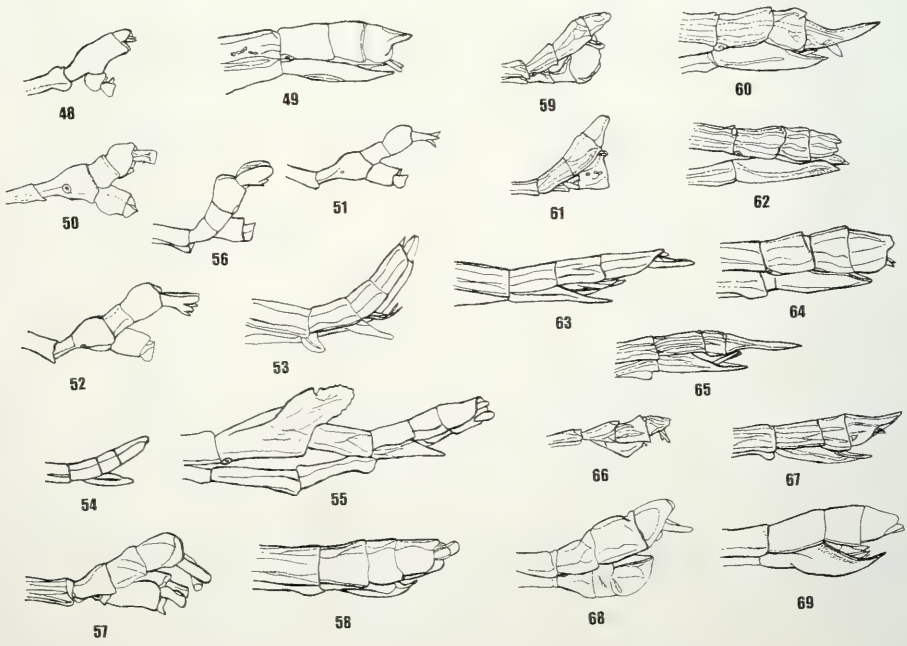
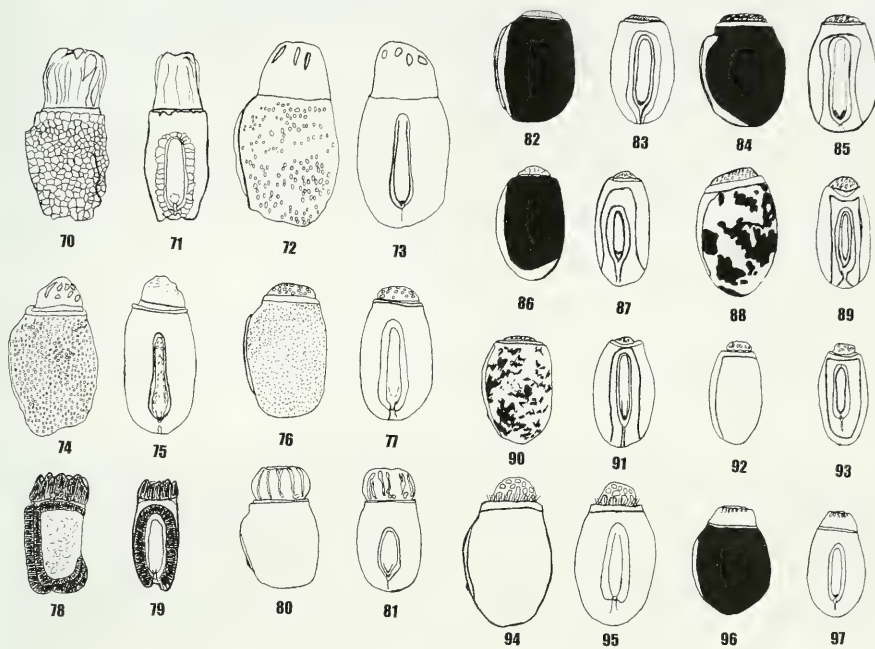


PLATE IV





## PLATE V



## PLATE VI

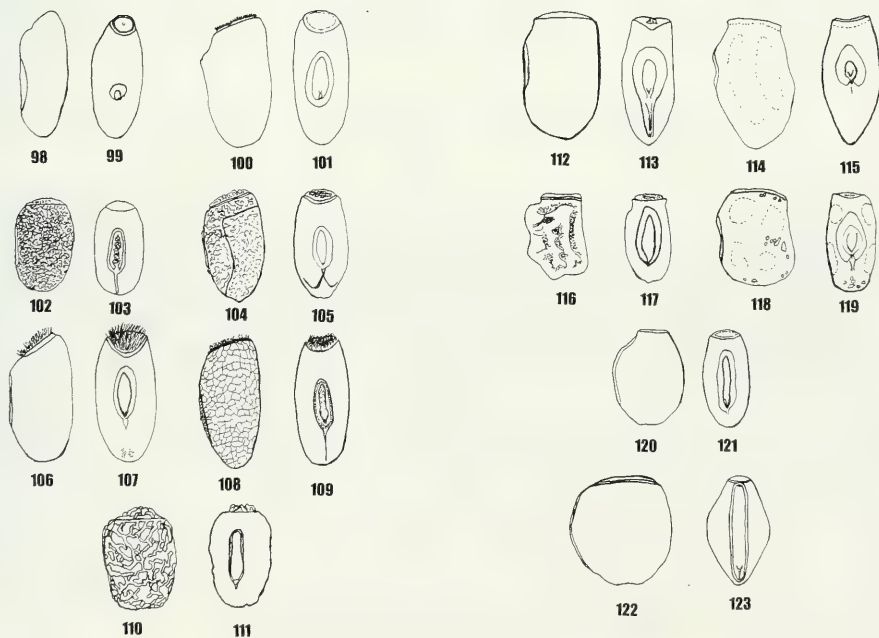


PLATE I. Terminal abdominal segments. Diapheromerini. *Phanocles* group. *Phanocloidea nodulosa* (Redtenbacher, 1908). 1. ♂, 2. ♀; *Phanocles burkartii* (Saussure, 1868). 3. ♀; *Phanocles* sp. n. Hennemann, i. pr. 4. ♂, 5. ♀; *Paraphanocles keratoskeleton* (Olivier, 1792). 6. ♂, 7. ♀; *Bostra turgida* (Westwood, 1859). 8. ♂, 9. ♀; *Alienobostira brocki* (Hausleithner, 1987). 10. ♂, 11. ♀.

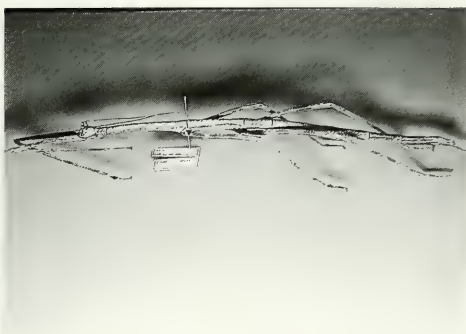
PLATE II. Terminal abdominal segments. Diapheromerini. *Bacteria* group. *Globocalynda simplex* (Brunner v. W., 1907). 12. ♂ lateral, 13. ♂ dorsal, 14. ♀; *Bacteria ferula* (Fabricius, 1793). 15. ♂, 16. ♀; *Calynda bicuspis* Stål, 1875. 17. ♀; *Calynda coronata* Carl, 1913. 18. ♂; *Paracalynda picta utilaensis* (Zompro, 1998). 19. ♂, 20. ♀. *Diapheromera* group. *Manomera tenuescens* (Scudder, 1900). 21. ♂, 22. ♀; *Diapheromera femorata* (Say, 1824). 23. ♂, 24. ♀; *Diapheromera* (*Rhabdoceratitis*) *beckeri* (Kaup, 1871). 25. ♂, 26. ♂, head lateral; *Megaphasma dentricum* (Stål, 1875). 27. ♂, 28. ♀; *Megaphasma furcatum* (Brunner v. W., 1907). 29. ♂.

PLATE III. Terminal abdominal segments. Diapheromerini. *Clonistria* group. *Clonistria bartholomaea* Stål, 1875. 30. ♂, 31. ♀; *Phantasca phantasma* (Westwood, 1859). 32. ♂, (after Westwood, 1859: pl. 12: 5a); *Libethroidea inusitata* Hebard, 1919. 33. ♂ (after Hebard, 1919, pl. 23: 7); *Libethroidea nodosa* (Giglio-Tos, 1898). 34. ♂, 35. ♀; *Libethra nisseri* Stål, 1875. 36. ♂, 37. ♀; *Pterolibethra* spec. 38. ♂; *Rugosolibethra rabdota* (Westwood, 1859). 39. ♂, 40. ♀ (after Westwood, 1859, pl. 22: 6b); *Spinopeplus festae* (Giglio-Tos, 1910). 41. ♂, 42. ♀; *Oncotophasma martini* (Griffini, 1896). 43. ♂; *Oncotophasma podagrica* (Stål, 1875). 44. ♀; *Trychopeplus spinosolobatus* (Redtenbacher, 1908). 45. ♀. *Dyme* group. *Dyme bifrons* Stål, 1875. 46. ♂, 47. ♀.

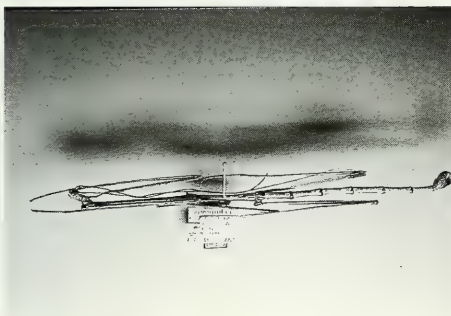
PLATE IV. Terminal abdominal segments. Diapheromerini. *Caribbiopheromera* group. *Caribbiopheromera jamaicana* gen. n. sp. n. 48. ♂, 49. ♀. *Diapheromera* group. *Pseudosermyle* sp. "*Heteronemia mexicana*" Brunner v. W., 1907. 50. ♂; *Pseudosermyle strigiceps* (Kaup, 1871). 51. ♂; *Pseudosermyle tridens* (Burmeister, 1838). 52. ♂, 53. ♀; *Litosermyle ocanae* Hebard, 1919. 54. ♀ (after Hebard, 1919, pl. 23: 9); *Sermyle mexicana* (Saussure, 1859). 55. ♀; *Sermyle bidens* (Kaup 1871) 56. ♂; *Sermyle kujawskii* Zompro, 1998. 57. ♂, 58. ♀. *Ocnophilini*. Terminal abdominal segments. *Ocnophila integra* Brunner v. W., 1907. 59. ♂, 60. ♀; *Ocnophiloidea regularis* (Brunner v. W., 1907). 61. ♂, 62. ♀; *Dubiophasma longicarinata* gen. n. sp. n. 63. ♀; *Exocnophila exintegra* (Brunner v. W., 1907). 64. ♀; *Parocnophila carinata* Zompro, 1998. 65. ♀; *Parocnophila latirostrata* sp. n. 66. ♂, 67. ♀; *Oreophoetini*. *Oreophoetes peruana* (Saussure, 1868). 68. ♂, 69. ♀.

PLATE V. Eggs. Diapheromerini. *Phanocles* group. *Phanocloidea nodulosa* (Redtenbacher, 1908). 70. lateral, 71. dorsal; *Phanocles burkartii* (Saussure, 1868). 72. lateral, 73. dorsal; *Phanocles* sp. n. Hennemann, i. pr. 74. lateral, 75. dorsal; *Paraphanocles keratoskeleton* (Olivier, 1792). 76. lateral, 77. dorsal; *Bostra turgida* (Westwood, 1859). 78. lateral, 79. dorsal; *Alienobostira brocki* (Hausleithner, 1987). 80. lateral, 81. dorsal. *Bacteria* group. *Globocalynda simplex* (Brunner v. W., 1907). 82. lateral, 83. dorsal; *Bacteria ferula* (Fabricius, 1793). 84. lateral, 85. dorsal; *Calynda bicuspis* Stål, 1875. 86. lateral, 87. dorsal; *Paracalynda picta utilaensis* (Zompro, 1998). 88. lateral, 89. dorsal. *Diapheromera* group. *Manomera tenuescens* (Scudder, 1900). 90. lateral, 91. dorsal; *Diapheromera femorata* (Say, 1824). 92. lateral, 93. dorsal; *Megaphasma dentricum* (Stål, 1875). 94. lateral, 95. dorsal. *Caribbiopheromera* group. *Caribbiopheromera jamaicana* gen. n. sp. n. 96. lateral, 97. dorsal.

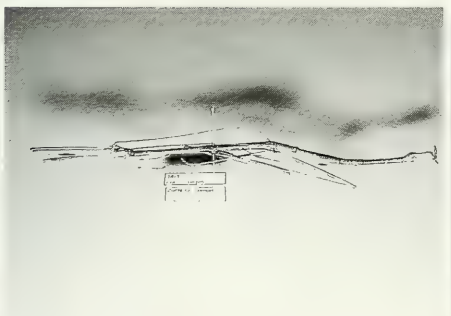
PLATE VI. Eggs. Diapheromerini. *Diapheromera* group. *Pseudosermyle tridens* (Burmeister, 1838). 98. lateral, 99. dorsal; *Sermyle kujawskii* Zompro, 1998. 100. lateral, 101. dorsal. *Clonistria* group. *Clonistria bartholomaea* Stål, 1875. 102. lateral, 103. dorsal; *Libethra nisseri* Stål, 1875. 104. lateral, 105. dorsal; *Spinopeplus festae* (Giglio-Tos, 1910). 106. lateral, 107. dorsal; *Oncotophasma podagricum* (Stål, 1875). 108. lateral, 109. dorsal. *Dyme* group. *Dyme* spec. 110. lateral, 111. dorsal. *Ocnophilini*. *Ocnophila integra* Brunner v. W., 1907. 112. lateral, 113. dorsal; *Ocnophiloidea regularis* (Brunner v. W., 1907). 114. lateral, 115. dorsal; *Dubiophasma longicarinata* gen. n. sp. n. 116. lateral, 117. dorsal; *Parocnophila latirostrata* n. sp. n. 118. lateral, 119. dorsal; *Exocnophila exintegra* gen. n. sp. n. 120. lateral, 121. dorsal. *Oreophoetini*. *Oreophoetes peruana* (Saussure, 1868). 122. lateral, 123. dorsal.



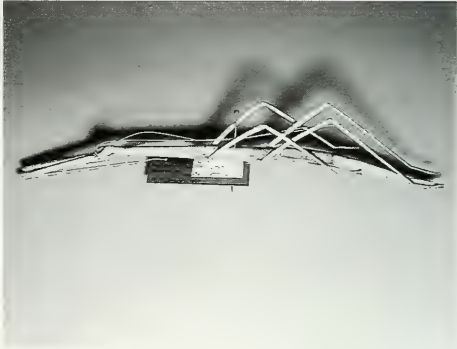
*Paraphanocles keratosqueleton* (Olivier, 1792). 124: ♂, 125: ♀



*Globocalynda simplex* (Brunner v. W., 1907). 126: ♂, 127: ♀



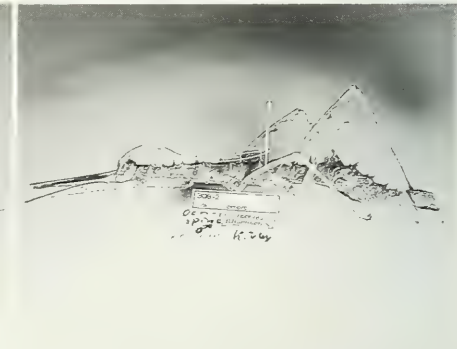
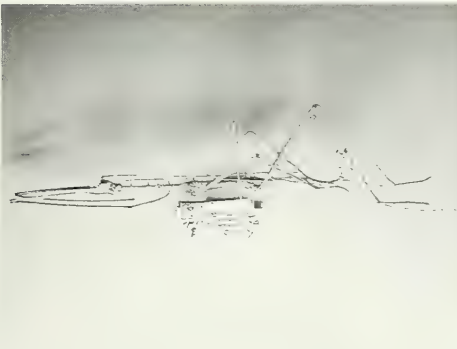
*Alienobostra brocki* (Hausleithner, 1987). 128: ♂, 129: ♀



*Paracalynda picta utilaensis* (Zompro, 1998). 130: ♂, 131: ♀



*Caribbiopheromera jamaicana* gen. n. sp. n. 132: PT ♂, 133: PT ♀

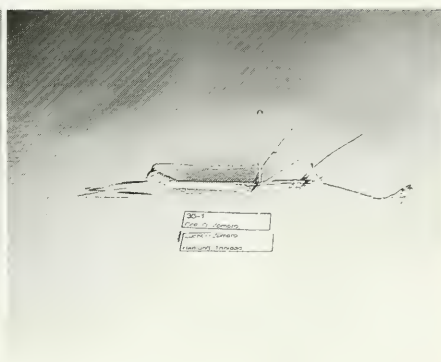


*Spinopeplus festae* (Giglio-Tos, 1910). 134: ♂, 135: ♀

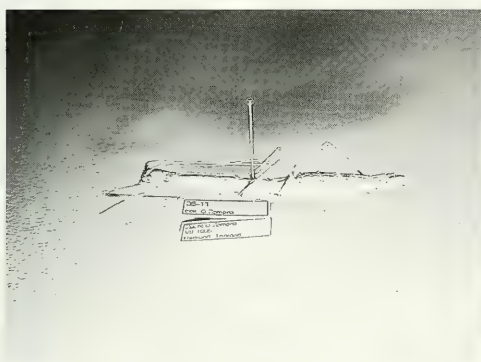




*Exocnophila xintegra* gen. n. sp. n. 136: HT ♀



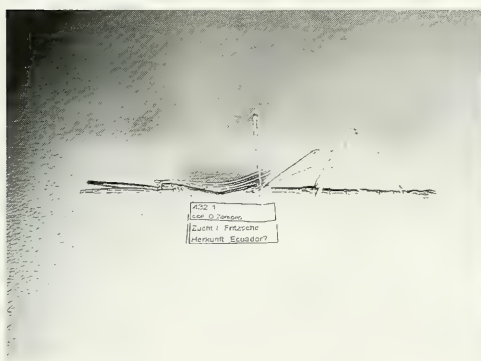
*Ocnophiloidea regularis*  
(Brunner v. W., 1907). 137: ♂



*Ocnophiloidea regularis*  
(Brunner v. W., 1907). 138: ♀



*Dubiophasma longicarinatum* gen. n. sp. n.  
139: HT ♀



*Parocnophila latirostrata* sp. n. 140: HT ♂, 141: PT ♀

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